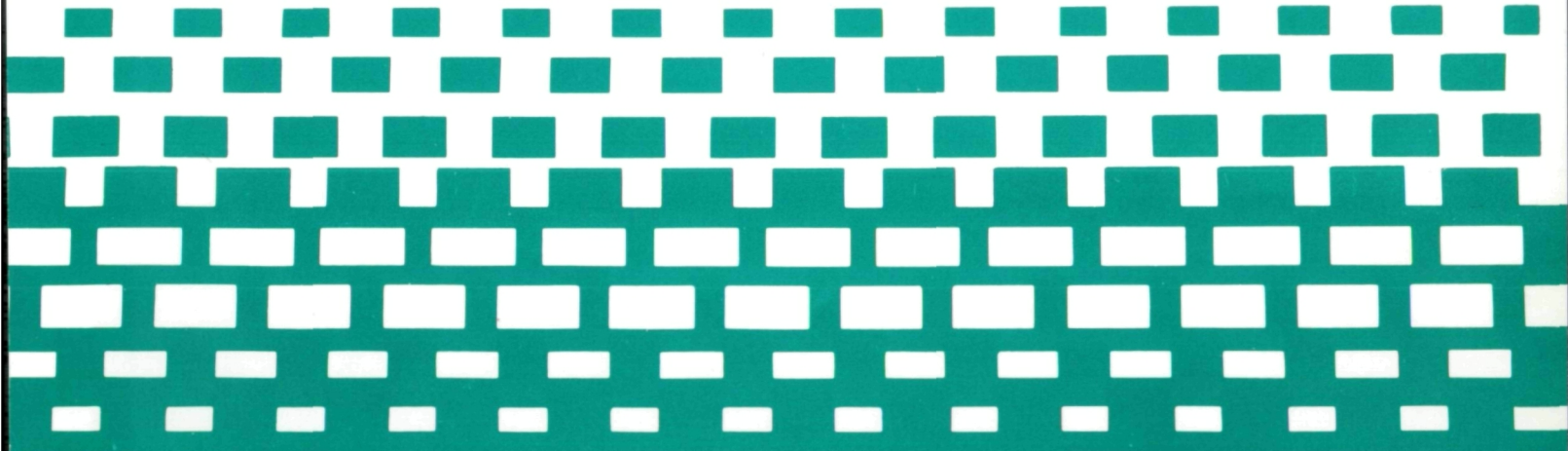
NASA SP-7039 (43)
July 1993

NASA PATENT ABSTRACTS BIBLIOGRAPHY

A CONTINUING BIBLIOGRAPHY
SECTION 1 ABSTRACTS



(NASA-SP-7039(43)-Sect-1) NASA PATENT ABSTRACTS BIBLIOGRAPHY: A CONTINUING BIBLIOGRAPHY. SECTION 1: ABSTRACTS (SUPPLEMENT 43) (NASA) 59 p

N93-31923

Unclas

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NASA STI PROGRAM SCIENTIFIC & TECHNICAL INFORMATION

ACCESSION NUMBER RANGES

Bibliography Number	*STAR Accession Numbers*
NASA SP-7039(04) SEC 1	N69-20701 - N73-33931
NASA SP-7039(12) SEC 1	N74-10001 - N77-34042
NASA SP-7039(13) SEC 1	N78-10001 - N78-22018
NASA SP-7039(14) SEC 1	N78-22019 - N78-34034
NASA SP-7039(15) SEC 1	N79-10001 - N79-21993
NASA SP-7039(16) SEC 1	N79-21994 - N79-34158
NASA SP-7039(17) SEC 1	N80-10001 - N80-22254
NASA SP-7039(18) SEC 1	N80-22255 - N80-34339
NASA SP-7039(19) SEC 1	N81-10001 - N81-21997
NASA SP-7039(20) SEC 1	N81-21998 - N81-34139
NASA SP-7039(21) SEC 1	N82-10001 - N82-22140
NASA SP-7039(22) SEC 1	N82-22141 - N82-34341
NASA SP-7039(23) SEC 1	N83-10001 - N83-23266
NASA SP-7039(24) SEC 1	N83-23267 - N83-37053
NASA SP-7039(25) SEC 1	N84-10001 - N84-22526
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NASA SP-7039(28) SEC 1	N85-22342 - N85-36162
NASA SP-7039(29) SEC 1	N86-10001 - N86-22536
NASA SP-7039(30) SEC 1	N86-22537 - N86-33262
NASA SP-7039(31) SEC 1	N87-10001 - N87-20170
NASA SP-7039(32) SEC 1	N87-20171 - N87-30248
NASA SP-7039(33) SEC 1	N88-10001 - N88-20253
NASA SP-7039(34) SEC 1	N88-20254 - N88-30583
NASA SP-7039(35) SEC 1	N89-10001 - N89-20085
NASA SP-7039(36) SEC 1	N89-20086 - N89-30155
NASA SP-7039(37) SEC 1	N90-10001 - N90-20043
NASA SP-7039(38) SEC 1	N90-20044 - N90-30170
NASA SP-7039(39) SEC 1	N91-10001 - N91-21058
NASA SP-7039(40) SEC 1	N91-21059 - N91-33053
NASA SP-7039(41) SEC 1	N92-10001 - N92-22095
NASA SP-7039(42) SEC 1	N92-22096 - N92-34247
NASA SP-7039(43) SEC 1	N93-10001 - N93-19958

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NASA PATENT ABSTRACTS BIBLIOGRAPHY

A CONTINUING BIBLIOGRAPHY
SECTION 1 ABSTRACTS

National Aeronautics and Space Administration
Scientific and Technical Information Program
Washington, DC 1993

This publication was prepared by, and is available from the NASA Center for AeroSpace Information, 800 Elkridge Landing Road, Linthicum Heights, MD 21090-2934, price code A04.

INTRODUCTION

Several thousand inventions result each year from the aeronautical and space research supported by the National Aeronautics and Space Administration. The inventions having important use in government programs or significant commercial potential are usually patented by NASA. These inventions cover practically all fields of technology and include many that have useful and valuable commercial application.

NASA inventions best serve the interests of the United States when their benefits are available to the public. In many instances, the granting of nonexclusive or exclusive licenses for the practice of these inventions may assist in the accomplishment of this objective. This bibliography is published as a service to companies, firms, and individuals seeking new, licensable products for the commercial market.

The *NASA Patent Abstracts Bibliography (NASA PAB)* is a semiannual NASA publication containing comprehensive abstracts and indexes of NASA-owned inventions covered by U.S. patents and applications for patent. The citations included in *NASA PAB* were originally published in NASA's *Scientific and Technical Aerospace Reports (STAR)* and cover *STAR* announcements made since May 1969.

For the convenience of the user, each issue of *NASA PAB* has a separately bound Abstract Section (Section 1) and Index Section (Section 2). Although each Abstract Section covers only the indicated six-month period, the Index Section is cumulative covering all NASA-owned inventions announced in *STAR* since 1969. Thus a complete set of *NASA PAB* would consist of the Abstract Sections of Issue 04 (January 1974) and Issue 12 (January 1978) and the Abstract Section for all subsequent issues and the Index Section for the most recent issue.

The 128 citations published in this issue of the Abstract Section cover the period January 1993 through June 1993. The Index Section references over 5400 citations covering the period May 1969 through June 1993.

ABSTRACT SECTION (SECTION 1)

This *PAB* issue includes 10 major subject divisions separated into 76 specific categories and one general category/division. (See Table of Contents for the scope note of each category, under which are grouped appropriate NASA inventions.) This scheme was devised in 1975 and revised in 1987 in lieu of the 34 category divisions which were utilized in *PAB* supplements (01) through (06) covering *STAR* abstracts from May 1969 through January 1974. Each entry in the Abstract Section consists of a *STAR* citation accompanied by an abstract and, when appropriate, a key illustration taken from the patent or application for patent. Entries are arranged by subject category in order of the ascending NASA Accession Number originally assigned for *STAR* to the invention. The range of NASA Accession Numbers within each issue is printed on the inside front cover.

Abstract Citation Data Elements: Each of the abstract citations has several data elements useful for identification and indexing purposes, as follows:

NASA Accession Number
NASA Case Number
Inventor's Name
Title of Invention
U.S. Patent Application Serial Number
U.S. Patent Number (for issued patents only)
U.S. Patent Office Classification Number(s)
(for issued patents only)

These data elements are identified in the Typical Citation and Abstract and in the indexes.

INDEX SECTION (SECTION 2)

The Index Section is divided into five indexes. These indexes are cross-indexed and are used to locate a single invention or groups of inventions.

Subject Index: Lists all inventions according to appropriate alphabetized technical term and indicates the related NASA Case Number, the Subject Category Number, and the Accession Number.

Inventor Index: Lists all inventions according to alphabetized names of inventors and indicates the related NASA Case Number, the Subject Category Number, and the Accession Number.

Source Index: Lists all inventions according to alphabetized source of invention (i.e., name of contractor or government installation where invention was made) and indicates the related NASA Case Number, the Subject Category Number, and the Accession Number.

Number Index: Lists inventions in order of ascending (1) NASA Case Number, (2) U.S. Patent Application Serial Number, (3) U.S. Patent Classification Number, and (4) U.S. Patent Number and indicates the related Subject Category Number and the Accession Number.

Accession Number Index: Lists all inventions in order of ascending Accession Number and indicates the related Subject Category Number, the NASA Case Number, the U.S. Patent Application Serial Number, the U.S. Patent Classification Number, and the U.S. Patent Number.

HOW TO USE THIS PUBLICATION TO IDENTIFY NASA INVENTIONS

To identify one or more NASA inventions within a specific technical field or subject, several techniques are possible with the flexibility incorporated into the *NASA PAB*.

(1) *Using Subject Category:* To identify all NASA inventions in any one of the subject categories in this issue of *NASA PAB*, select the desired Subject Category in the Abstract Section (Section 1) and find the inventions abstracted thereunder.

(2) *Using Subject Index:* To identify all NASA inventions listed under a desired technical subject index term, (A) turn to the cumulative Subject Index in the Index Section and find the invention(s) listed under the desired technical subject term. (B) Note the indicated Accession Number and the Subject Category Number. (C) Using the indicated Accession Number, turn to the inside front cover of the Index Section to determine which issue of the Abstract Section includes the Accession Number desired. (D) To find the abstract of the particular invention in the issue of the Abstract Section selected, (1) use the Subject Category Number to locate the Subject Category and (2) use the Accession Number to locate the desired invention within the Subject Category listing.

(3) *Using Patent Classification Index:* To identify all inventions covered by issued NASA patents (not including applications for patent) within a desired Patent Classification, (A) turn to the Patent Classification Number in the Number Index of Section 2 and find the associated invention(s), and (B) follow the instructions outlined in (2)(B), and (D) above.

TYPICAL CITATION AND ABSTRACT

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ACCESSION NUMBER → N93-17048*# National Aeronautics and Space Administration. ← CORPORATE SOURCE
Langley Research Center, Hampton, VA.

TITLE → **RAPID DETECTION AND QUANTIFICATION OF FEATURES SUCH AS DAMAGE OR FLAWS IN COMPOSITE AND METALLIC STRUCTURES Patent Application**

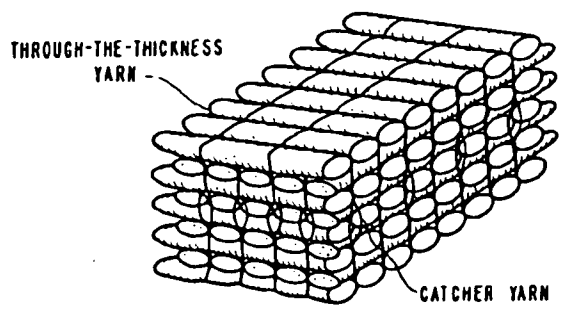
INVENTORS → GARY L. FARLEY, inventor (to NASA), BARRY T. SMITH, inventor (to NASA), JOSEPH N. ZALAMEDA, inventor (to NASA), and WILLIAM P. WINFREE, inventor (to NASA) 29 Oct. 1992 27 p

NASA CASE NUMBER → (NASA-CASE-LAR-14850-1-CU; NAS 1.71:LAR-14850-1-CU; US-PATENT-APPL-SN-969869) Avail: CASI HC A03/MF A01 ← AVAILABILITY SOURCE

US PATENT APPLICATIONS SERIAL NUMBERS →

An apparatus, system, and method for non-destructible evaluation (NDE) of a material use thermography to rapidly detect and/or generally locate a feature such as, for example, damage or a defect in the material. The apparatus, system, and method also use ultrasound to specifically locate the feature in the material for quantification and/or evaluation either by an operator or by an external device suited for such purpose. Accordingly, the apparatus, system and method are particularly useful for NDE in applications such as the analysis of the structure of an aircraft, for example, in which the scale of the material to be analyzed is large, thus requiring the rapid NDE afforded by thermography, and in which quantification and/or evaluation of a feature must be performed with precision, thus requiring the relatively high-resolution NDE afforded by ultrasound. ← ABSTRACT

NASA



← KEY ILLUSTRATION

TABLE OF CONTENTS

Section 1 • Abstracts

N.A.—no abstracts were assigned to this category for this issue.

CHEMISTRY AND MATERIALS

ENGINEERING For related information see also *Physics.*

GEOSCIENCES For related information see also *Space Sciences.*

LIFE SCIENCES

MATHEMATICAL AND COMPUTER SCIENCES

PHYSICS For related information see also *Engineering.*

SOCIAL SCIENCES

SPACE SCIENCES For related information see also *Geosciences.*

GENERAL

Includes aeronautical, astronautical, and space science related histories, biographies, and pertinent reports too broad for categorization; histories or broad overviews of NASA programs.

Section 2 • Indexes

JULY 1993 (Supplement 43)

NASA Patent Abstracts Bibliography

A Semiannual Publication of the National Aeronautics and Space Administration

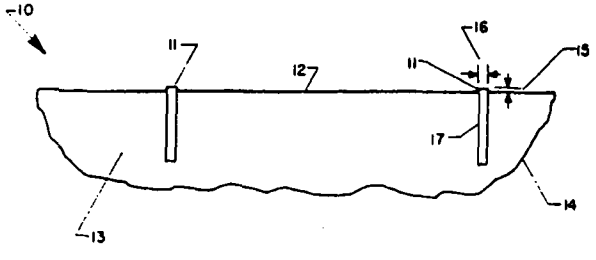
02
AERODYNAMICS

Includes aerodynamics of bodies, combinations, wings, rotors, and control surfaces; and internal flow in ducts and turbomachinery.

N93-11876*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
BOUNDARY LAYER RELAMINARIZATION DEVICE Patent Application
THEODORE R. CREEL, inventor (to NASA) 7 Jan. 1992 13 p (NASA-CASE-LAR-14470-1; NAS 1.71:LAR-14470-1; US-PATENT-APPL-SN-823809) Avail: CASI HC A03/MF A01

Relamination of a boundary layer formed in supersonic flow over the leading edge of a swept airfoil is accomplished by means of at least one band, especially a quadrangular band, and most preferably a square band. Each band conforms to the leading edge and the upper and lower surfaces of the airfoil as an integral part thereof and extends perpendicularly from the leading edge. Each band has a height of about two times the thickness of the maximum expected boundary layer.

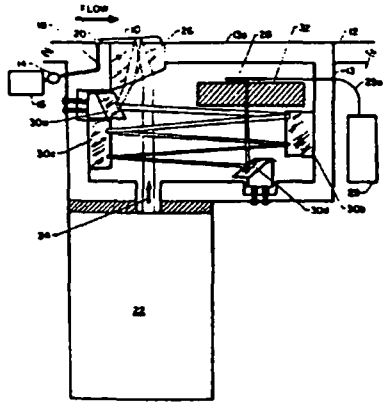
NASA



N93-18275* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
REFLECTION TYPE SKIN FRICTION METER Patent
PROMODE R. BANDYOPADHYAY, inventor (to NASA) (AS&M, Inc., Hampton, VA.) and LEONARD M. WEINSTEIN, inventor (to NASA) 12 Jan. 1993 6 p Filed 8 Aug. 1991 Supersedes 92N-10008 (30 - 1, p 2)
(NASA-CASE-LAR-14520-1-SB; US-PATENT-5,178,004; US-PATENT-APPL-SN-742238; US-PATENT-CLASS-73-147; US-PATENT-CLASS-73-9; INT-PATENT-CLASS-G01M-9/00) Avail: US Patent and Trademark Office

A housing block is provided having an upper surface conforming to the test surface of a model or aircraft. An oil film is supplied upstream of a transparent wedge window located in this upper surface by an oil pump system located external to the housing block. A light source located within the housing block supplies a light beam which passes through this transparent window and is reflected back through the transparent window by the upper surface of the oil film to a photo-sensitive position sensor located within the housing. This position sensor allows the slope history of the oil film caused by and aerodynamic flow to be determined. The skin friction is determined from this slope history. Internally located mirrors augment and sensitize the reflected beam as necessary before reaching the position sensor. In addition, a filter may be provided before this sensor to filter the beam.

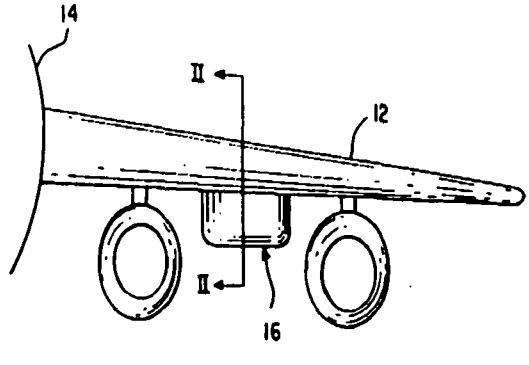
Official Gazette of the U.S. Patent and Trademark Office



N93-19053*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
UNDERWING COMPRESSION VORTEX ATTENUATION DEVICE Patent Application
JAMES C. PATTERSON, inventor (to NASA) 22 May 1992 7 p (NASA-CASE-LAR-14744-1; NAS 1.71:LAR-14744-1; US-PATENT-APPL-SN-886998) Avail: CASI HC A02/MF A01

A vortex attenuation device is presented which dissipates a lift-induced vortex generated by a lifting aircraft wing. The device consists of a positive pressure gradient producing means in the form of a compression panel attached to the lower surface of the wing and facing perpendicular to the airflow across the wing. The panel is located between the midpoint of the local wing cord and the trailing edge in the chord-wise direction and at a point which is approximately 55 percent of the wing span as measured from the fuselage center line in the spanwise direction. When deployed in flight, this panel produces a positive pressure gradient aligned with the final roll-up of the total vortex system which interrupts the axial flow in the vortex core and causes the vortex to collapse.

NASA



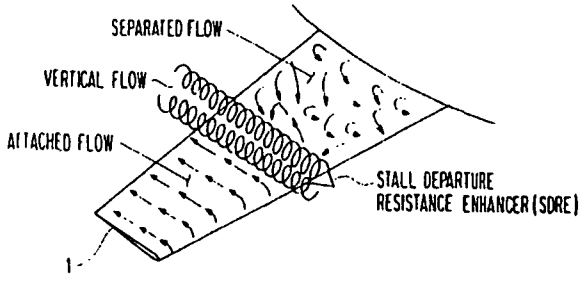
06
AIRCRAFT INSTRUMENTATION

Includes cockpit and cabin display devices; and flight instruments.

N93-19023*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
STALL DEPARTURE RESISTANCE ENHANCER Patent Application
HOLLY M. ROSS, inventor (to NASA), JOSEPH L. JOHNSON, JR., inventor (to NASA), LONG P. YIP, inventor (to NASA), and H. PAUL STOUGH, III, inventor (to NASA) 4 Jan. 1993 10 p (NASA-CASE-LAR-14221-1; NAS 1.71:LAR-14221-1; US-PATENT-APPL-SN-000064) Avail: CASI HC A02/MF A01

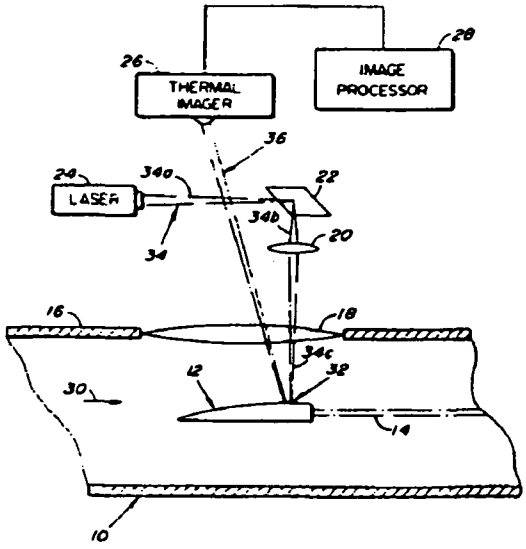
A stall departure resistance enhancer for an aircraft for controlling flow separation by inducing vortical flow over the upper surface of the wing is described. A flat triangular plate is secured to a leading edge of the wing to reduce drag, and the tip of the triangular plate is sharp and the edges are thin and sharp to induce good vortical flow. The thickness of the plate is minimal, but it is sufficient so that the plate remains rigid for all angles of attack. A tip of the triangular plate protrudes forward from the leading edge of the wing, and the centerline of the triangular plate extending through the tip is aligned in the freestream direction. In a second embodiment, the triangular plate is hingedly secured to the leading edge of the wing, and a stop is provided to limit the hinged movement of the plate at or near the stall angle of attack.

NASA



A sample in a wind tunnel is radiated from a thermal energy source outside of the wind tunnel. A thermal imager system, also located outside of the wind tunnel, reads surface radiations from the sample as a function of time. The produced thermal images are characteristic of the heat transferred from the sample to the flow across the sample. In turn, the measured rates of heat loss of the sample are characteristic of the flow and the sample.

Official Gazette of the U.S. Patent and Trademark Office



09
RESEARCH AND SUPPORT FACILITIES (AIR)

Includes airports, hangars and runways; aircraft repair and overhaul facilities; wind tunnels; shock tubes; and aircraft engine test stands.

N93-11057* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
METHOD OF REMOTELY CHARACTERIZING THERMAL PROPERTIES OF A SAMPLE Patent
JOSEPH S. HEYMAN, inventor (to NASA), D. MICHELE HEATH, inventor (to NASA), CHRISTOPHER WELCH, inventor (to NASA), WILLIAM P. WINFREE, inventor (to NASA), and WILLIAM E. MILLER, inventor (to NASA) 21 Jul. 1992 5 p Filed 30 Sep. 1991 Continuation of US-Patent-Appl-SN-524108, filed 16 May 1990 which is a continuation of US-Patent-Appl-SN-146939, filed 22 Jan. 1988 (NASA-CASE-LAR-13508-3-CU; US-PATENT-5,131,758; US-PATENT-APPL-SN-768094; US-PATENT-APPL-SN-524108; US-PATENT-APPL-SN-146939; US-PATENT-CLASS-374-5; US-PATENT-CLASS-374-4; US-PATENT-CLASS-374-57; US-PATENT-CLASS-73-147; INT-PATENT-CLASS-G01N-25/72) Avail: US Patent and Trademark Office

18
SPACECRAFT DESIGN, TESTING AND PERFORMANCE

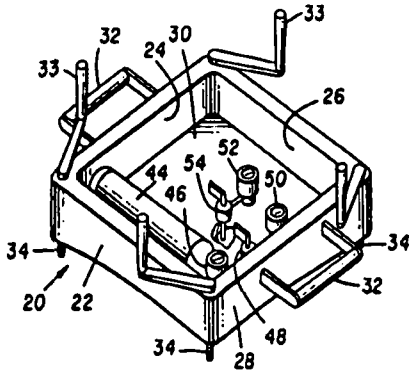
Includes satellites; space platforms; space stations; spacecraft systems and components such as thermal and environmental controls; and attitude controls.

N93-17061*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
PRESSURE WALL PATCH Patent Application
JOEL E. WILLIAMSEN, inventor (to NASA) and BRUCE WEDDENDORF, inventor (to NASA) 15 Oct. 1992 15 p (NASA-CASE-MFS-28724-1; NAS 1.71:MFS-28724-1; US-PATENT-APPL-SN-961293) Avail: CASI HC A03/MF A01

A rigid patch body for placing over a damaged portion (hole) of an external wall of a pressurized vessel, such as a space vehicle or a habitat, is discussed. The rigid patch body allows an astronaut to make temporary repairs to the pressurized vessel from the exterior of the vessel, which enables more permanent repairs to be made from the interior of the vessel. The pressure wall patch of the present invention includes a floor surrounded by four side members. Each side member includes a threaded screw for anchoring the patch body to the external wall of the pressurized vessel and a recess in its lower surface for supporting an inflatable bladder for surrounding the damaged portion (hole) of the external wall to seal the area

repressurized. The floor of the rigid patch body supports a source of gas that is connected to the gas supply valve and a gas supply gauge in communication with the gas supply valve and the inflatable bladder.

NASA



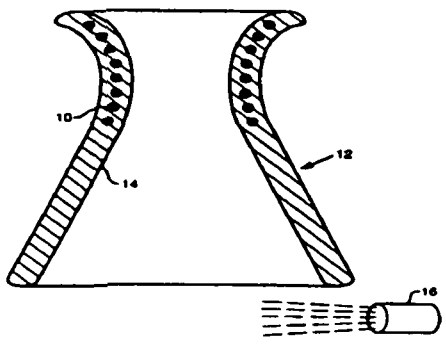
20
SPACECRAFT PROPULSION AND POWER

Includes main propulsion systems and components, e.g., rocket engines; and spacecraft auxiliary power sources.

N93-18856* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
SPECTROSCOPIC WEAR DETECTOR Patent
GEORGE C. MADZSAR, inventor (to NASA) 16 Feb. 1993 7 p Filed 27 Jun. 1991 Supersedes N91-32167 (29 - 24, p 3968)
(NASA-CASE-LEW-15200-1; US-PATENT-5,187,542; US-PATENT-APPL-SN-722446; US-PATENT-CLASS-356-300; US-PATENT-CLASS-73-86; US-PATENT-CLASS-60-223; US-PATENT-CLASS-356-311; US-PATENT-CLASS-356-36; INT-PATENT-CLASS-G01J-3/00; INT-PATENT-CLASS-G01N-21/00) Avail: US Patent and Trademark Office

The elemental composition of a material exposed to hot gases and subjected to wear is determined. Atoms of an elemental species not appearing in this material are implanted in a surface at a depth based on the maximum allowable wear. The exhaust gases are spectroscopically monitored to determine the exposure of these atoms when the maximum allowable wear is reached.

Official Gazette of the U.S. Patent and Trademark Office



N93-17412*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
SUBSTITUTED 1,1,1-TRIARYL 2,2,2-TRIFLUOROETHANES AND PROCESSES FOR THEIR SYNTHESIS Patent Application
WILLIAM B. ALSTON, inventor (to NASA) and ROY F. GRATZ, inventor (to NASA) 27 Nov. 1992 23 p
(NASA-CASE-LEW-14345-7; NAS 1.71:LEW-14345-7; US-PATENT-APPL-SN-982350) Avail: CASI HC A03/MF A01

Synthetic procedures to tetraalkyls, tetraacids, and dianhydrides substituted 1,1,1-triaryl 2,2,2-trifluoroethanes which comprises: (1) 1,1-bis(dialkylaryl) 1-aryl-2,2,2-trifluoroethane, (2) 1,1-bis(dicarboxyaryl) 1-aryl-2,2,2-trifluoroethane, or (3) cyclic dianhydride or diamine of 1,1-bis(dialkylaryl) 1-aryl-2,2,2-trifluoroethanes. The synthesis of (1) is accomplished by the condensation reaction of an aryltrifluoromethyl ketone with a dialkylaryl compound. The synthesis of (2) is accomplished by oxidation of (1). The synthesis dianhydride of (3) is accomplished by the conversion of (2) to its corresponding cyclic dianhydride. The synthesis of the diamine is accomplished by the similar reaction of an aryltrifluoromethyl ketone with aniline or alkyl substituted or disubstituted anilines. Also, other derivatives of the above are formed by nucleophilic displacement reactions.

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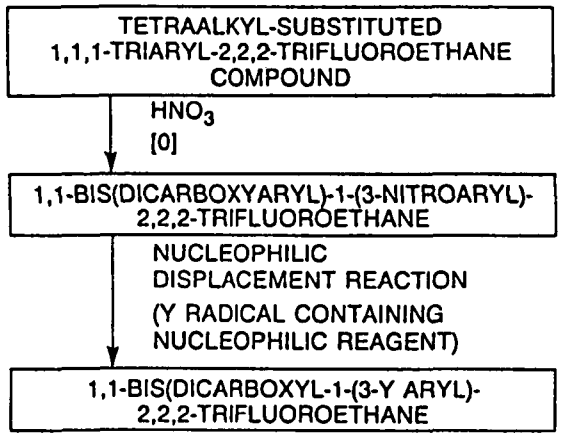


N93-18283* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
POLY(1,2,4-TRIAZOLE) VIA AROMATIC NUCLEOPHILIC DISPLACEMENT Patent
JOHN W. CONNELL, inventor (to NASA), PAUL M. HERGENROTHER, inventor (to NASA), and PETER WOLF, inventor (to NASA) 26 Jan. 1993 9 p Filed 24 Jan. 1991 Supersedes N92-10066 (30 - 1, p 13)
(NASA-CASE-LAR-14440-1; US-PATENT-5,182,356; US-PATENT-APPL-SN-650336; US-PATENT-CLASS-528-128; US-PATENT-CLASS-528-125; US-PATENT-CLASS-528-126; US-PATENT-CLASS-528-168; US-PATENT-CLASS-528-169; US-PATENT-CLASS-528-172; US-PATENT-CLASS-528-174) Avail: US Patent and Trademark Office

The primary object of this invention constitutes new compositions of matter and a new process to prepare poly(1,2,4-triazoles) (PT). It concerns new PT, novel monomers, and the process for preparing the same. Another object of the present invention is to provide new PT that are useful as composite matrix resins for aircraft

and dielectric interlayers in electronic devices. Another object of the present invention is the composition of several new di(hyproxyphenyl)-1,2,4-triazole monomers. According to the present invention, the foregoing and additional objects were obtained by synthesizing PT by the nucleophilic displacement reaction of di(hydroxyphenyl)-1,2,4-triazole monomers with activated aromatic dihalides. The inherent viscosities of the PT ranged from 1.37 to 3.4 dL/g and the glass transition temperatures ranged from 192 to 216 C. One polymer exhibited a crystalline melting temperature of 377 C. Thermogravimetric analysis (TGA) showed no weight loss occuring below 300 C in air or nitrogen with a 5 perceet weight loss occuring at approximately 500 C in air and nitrogen. The synthesis of the di(hydroxphenyl)-1,2,4-triazole monomer is represented in an equation. The monomer can be prepared by either of the two routes shown. The chemistry can easily be extended to prepare similar di(hydroxyphenyl)-1,2,4-triazole monomers. The aromatic dihydrazides in some cases are commercially available or readily prepared from hydrazine and a di(acid chloride). The substitution of the hydroxy groups in either type of monomer may be meta-meta, para-para, or para-meta. The general reaction sequence of PT from each type of di(hydroxyphenyl)-1,2,4-triazole monomer is shown.

Official Gazette of the U.S. Patent and Trademark Office

24
COMPOSITE MATERIALS

Includes physical, chemical, and mechanical properties of laminates and other composite materials.

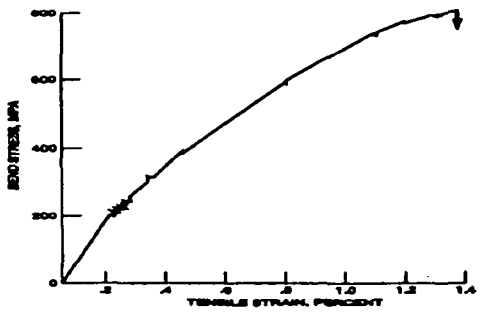
N93-11543*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

SILICON CARBIDE FIBER REINFORCED STRONTIUM ALUMINOSILICATE GLASS-CERAMIC MATRIX COMPOSITE Patent Application

NAROTTAM BANSAL, inventor (to NASA) 4 Jun. 1992 7 p (NASA-CASE-LEW-15263-1; NAS 1.71:LEW-15263-1; US-PATENT-APPL-SN-892054) Avail: CASI HC A02/MF A01

A SrO-Al2O3 - 2SrO2 (SAS) glass ceramic matrix is reinforced with CVD SiC continuous fibers. This material is prepared by casting a slurry of SAS glass powder into tapes. Mats of continuous CVD-SiC fibers are alternately stacked with the matrix tapes. This tape-mat stack is warm-pressed to produce a 'green' composite. Organic constituents are burned out of the 'green' composite, and the remaining interim material is hot pressed.

NASA



N93-13416* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

A TOUGH HIGH PERFORMANCE COMPOSITE MATRIX Patent

RUTH H. PATER, inventor (to NASA) and NORMAN J. JOHNSTON, inventor (to NASA) 27 Oct. 1992 13 p Filed 31 Oct. 1989 Supersedes N90-26881 (28 - 21, p 2970) (NASA-CASE-LAR-14338-1; US-PATENT-5,159,029; US-PATENT-APPL-SN-429514; US-PATENT-CLASS-525-421; US-PATENT-CLASS-525-426; US-PATENT-CLASS-525-432; US-PATENT-CLASS-525-436; US-PATENT-CLASS-525-903; INT-PATENT-CLASS-C08L-49/08; INT-PATENT-CLASS-C08J-5/08) Avail: US Patent and Trademark Office

This invention is a semi-interpenetrating polymer network which includes a high performance thermosetting polyimide having a nadic end group acting as a crosslinking site and a high performance linear thermoplastic polyimide. An improved high temperature matrix resin is provided which is capable of performing in the 200 to 300 C range. This resin has significantly improved toughness and microcracking resistance, excellent processability, mechanical performance and moisture and solvent resistances.

Official Gazette of the U.S. Patent and Trademark Office

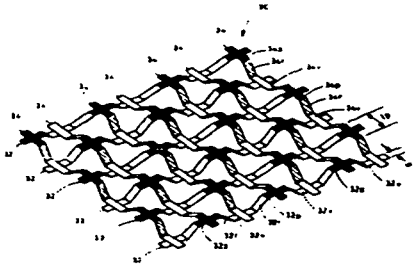
N93-14700* National Aeronautics and Space Administration. Pasadena Office, CA.

CORE DESIGN FOR USE WITH PRECISION COMPOSITE REFLECTORS Patent

CHRISTOPHER C. PORTER, inventor (to NASA), PAUL J. JACOY, inventor (to NASA), and WESLEY P. SCHMITIGAL, inventor (to NASA) 10 Nov. 1992 11 p Filed 30 Mar. 1990 Supersedes N90-26880 (28- 21, p 2970)
(Contract NAS7-918)
(NASA-CASE-NPO-17858-1-CU; US-PATENT-5,162,143; US-PATENT-APPL-SN-503487; US-PATENT-CLASS-428-179; US-PATENT-CLASS-428-105; US-PATENT-CLASS-428-182; US-PATENT-CLASS-428-184; US-PATENT-CLASS-428-185; US-PATENT-CLASS-428-186; US-PATENT-CLASS-428-213) Avail: US Patent and Trademark Office

A uniformly flexible core, and method for manufacturing the same, is disclosed for use between the face plates of a sandwich structure. The core is made of a plurality of thin corrugated strips, the corrugations being defined by a plurality of peaks and valleys connected to one another by a plurality of diagonal risers. The corrugated strips are orthogonally criss-crossed to form the core. The core is particularly suitable for use with high accuracy spherically curved sandwich structures because undesirable stresses in the curved face plates are minimized due to the uniform flexibility characteristics of the core in both the X and Y directions. The core is self venting because of the open geometry of the corrugations. The core can be made from any suitable composite, metal, or polymer. Thermal expansion problems in sandwich structures may be minimized by making the core from the same composite materials that are selected in the manufacture of the curved face plates because of their low coefficients of thermal expansion. Where the strips are made of a composite material, the core may be constructed by first cutting an already cured corrugated sheet into a plurality of corrugated strips and then secondarily bonding the strips to one another or, alternatively, by lying a plurality of uncured strips orthogonally over one another in a suitable jig and then curing and bonding the entire plurality of strips to one another in a single operation.

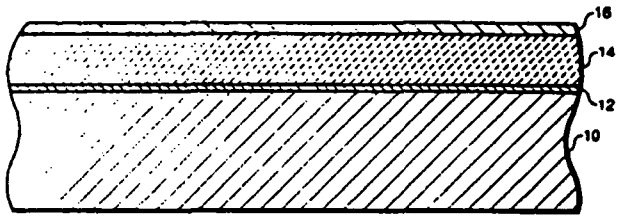
Official Gazette of the U.S. Patent and Trademark Office



N93-14706* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
METHOD OF APPLYING A THERMAL BARRIER COATING SYSTEM TO A SUBSTRATE Patent
ROBERT A. MILLER, inventor (to NASA) 8 Dec. 1992 5 p Filed 23 May 1991 Supersedes N91-25202 (29 - 17, p 2747) Division of abandoned US-Patent-Appl-SN-601957, filed 23 Oct. 1990 (NASA-CASE-LEW-15020-2; US-PATENT-5,169,674; US-PATENT-APPL-SN-708255; US-PATENT-APPL-SN-601957; US-PATENT-CLASS-427-456; US-PATENT-CLASS-427-367; US-PATENT-CLASS-427-404; US-PATENT-CLASS-427-419.2; INT-PATENT-CLASS-B05D-1/02; INT-PATENT-CLASS-B05D-3/12) Avail: US Patent and Trademark Office

A metallic close-out layer is applied to the surface of a thermal barrier coating system to seal the ceramic material in the coating. The close-out layer is glass-bead preened to densify the surface.

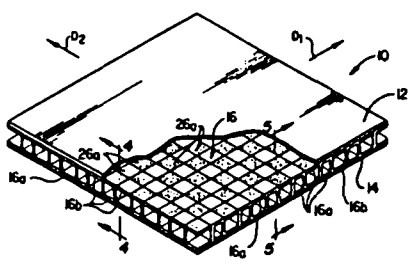
Official Gazette of the U.S. Patent and Trademark Office



N93-19022*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
SANDWICHED STRUCTURAL PANEL HAVING A BI-DIRECTIONAL CORE STRUCTURE Patent Application
BRUCE WEDDENDORF, inventor (to NASA) 8 Jan. 1993 13 p (NASA-CASE-MFS-28796-1; NAS 1.71:MFS-28796-1; US-PATENT-APPL-SN-002002) Avail: CASI HC A03/MF A01

A structural panel assembly has a bi-directional core structure sandwiched between and secured to a pair of outer side wall members. The core structure is formed from first and second perpendicular series of elongated strip members having crenelated configurations. The strip members in the first series thereof are transversely interwoven with the strip members in the second series thereof in a manner such that crest portions of the strip members in the first series overlie and oppose trough portions of the strip members in the second series, and trough portions of the strip members in the first series underlie and oppose crest portions of the strip members in the second series. The crest portions of all of the strip members lie generally in a first plane and are secured to the inner side of one of the panel assembly outer side walls, and the trough portions of all of the strip members lie generally in a second plane and are secured to the inner side of the other panel assembly outer side wall.

NASA



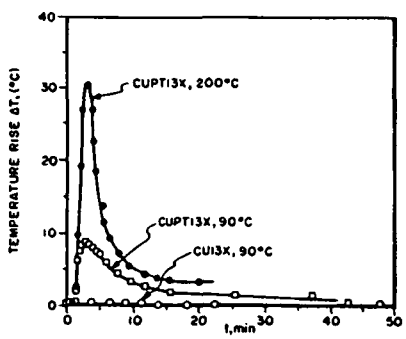
25
INORGANIC AND PHYSICAL CHEMISTRY

Includes chemical analysis, e.g., chromatography; combustion theory; electrochemistry; and photochemistry.

N93-19025*# National Aeronautics and Space Administration. Pasadena Office, CA.
HIGH TEMPERATURE SORBENTS FOR OXYGEN Patent Application
PRAMOD K. SHARMA, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 16 Dec. 1992 13 p (ContractNAS7-918)
(NASA-CASE-NPO-18409-1-CU; NAS 1.71:NPO-18409-1-CU; US-PATENT-APPL-SN-991003) Avail: CASI HC A03/MF A01

A sorbent capable of removing trace amounts of oxygen (ppt) from a gas stream at a high temperature above 200 C comprising a porous alumina silicate support such as zeolite containing from 1 to 10 percent by weight of ion exchanged transition metal such as copper or cobalt ions and 0.05 to 1.0 percent by weight of an activator selected from a platinum group metal such as platinum is described. The activation temperature, oxygen sorption, and reducibility are all improved by the presence of the platinum activator.

NASA



26
METALLIC MATERIALS

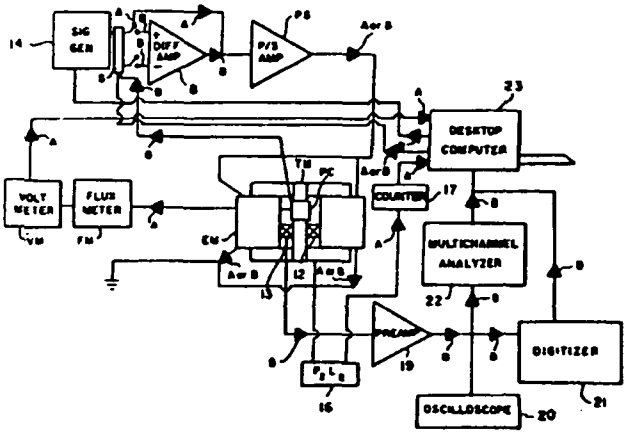
Includes physical, chemical, and mechanical properties of metals, e.g., corrosion; and metallurgy.

N93-14705* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
METHOD OF CHARACTERIZING RESIDUAL STRESS IN FERROMAGNETIC MATERIALS USING A PULSE HISTOGRAM OF ACOUSTIC EMISSION SIGNALS Patent
MIN NAMKUNG, inventor (to NASA), WILLIAM T. YOST, inventor (to NASA), PETER W. KUSHNICK, inventor (to NASA), and JOHN L. GRAINGER, inventor (to NASA) 17 Nov. 1992 14 p Filed 23 Jul. 1990 Supersedes N91-13527 (29 - 5, p 636)
(NASA-CASE-LAR-14239-1; US-PATENT-5,164-669; US-PATENT-APPL-SN-555864; US-PATENT-CLASS-324-209; US-PATENT-CLASS-73-598; US-PATENT-CLASS-73-801; US-PATENT-CLASS-324-227; US-PATENT-CLASS-324-232; INT-PATENT-CLASS-G01B-33/12; INT-PATENT-CLASS-G01B-7/24) Avail: US Patent and Trademark Office

The invention is a method and apparatus for characterizing residual uniaxial stress in a ferromagnetic test member by distinguishing between residual stresses resulting from positive (tension) forces and negative (compression) forces by using the distinct and

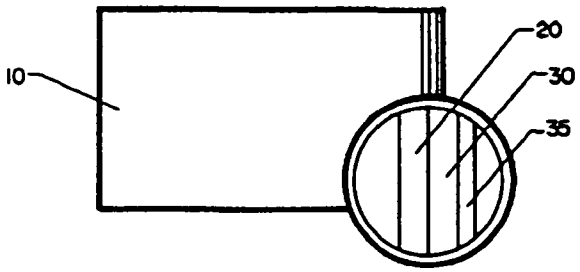
known magnetoacoustic (MAC) and a magnetoacoustic emission (MAE) measurement circuit means. A switch permits the selective operation of the respective circuit means.

Official Gazette of the U.S. Patent and Trademark Office



A thin, light-weight, multi-layer coating is provided for protecting metals and their alloys from environmental attack at high temperatures. A reaction barrier is applied to the metal substrate and a diffusion barrier is then applied to the reaction barrier. A sealant layer may also be applied to the diffusion barrier if desired. The reaction barrier is either non-reactive or passivating with respect to the metal substrate and the diffusion barrier. The diffusion barrier is either non-reactive or passivating with respect to the reaction barrier and the sealant layer. The sealant layer is immiscible with the diffusion barrier and has a softening point below the expected use temperature of the metal.

NASA



27
NONMETALLIC MATERIALS

Includes physical, chemical, and mechanical properties of plastics, elastomers, lubricants, polymers, textiles, adhesives, and ceramic materials.

N93-11059* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

SEMI-INTERPENETRATING POLYMER NETWORK FOR TOUGHER AND MORE MICROCRACKING RESISTANT HIGH TEMPERATURE POLYMERS Patent

RUTH H. PATER, inventor (to NASA) 22 Sep. 1992 11 p Filed 6 Mar. 1991 Division of US-Patent-Appl-SN-301925, filed 26 Jan. 1989

(NASA-CASE-LAR-13925-2; US-PATENT-5,149,746; US-PATENT-APPL-SN-665371; US-PATENT-APPL-SN-301925; US-PATENT-CLASS-525-422; US-PATENT-CLASS-525-432; US-PATENT-CLASS-525-903; INT-PATENT-CLASS-C08L-79/08) Avail: US Patent and Trademark Office

A process for making a semi-interpenetrating polymer network which includes a high performance thermosetting polyimide having a nadic end group acting as a crosslinking site and a high performance linear thermoplastic polyimide is disclosed. Provided is an improved high temperature matrix resin which is capable of performing at 316 C in air for several hundreds of hours. This resin has significantly improved toughness and microcracking resistance, excellent processability and mechanical performance, and cost effectiveness.

Official Gazette of the U.S. Patent and Trademark Office

N93-11912*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

MULTI-LAYER LIGHT-WEIGHT PROTECTIVE COATING AND METHOD FOR APPLICATION Patent Application

KARL E. WIEDEMANN, inventor (to NASA) (AS&M, Inc., Hampton, VA.), RONALD K. CLARK, inventor (to NASA), and PATRICK J. TAYLOR, inventor (to NASA) (AS&M, Inc., Hampton, VA.) 10 Jul. 1992 17 p

(NASA-CASE-LAR-14448-1; NAS 1.71:LAR-14448-1; US-PATENT-APPL-SN-912960) Avail: CASI HC A03/MF A01

N93-14709* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

LOW TOXICITY HIGH TEMPERATURE PMR POLYIMIDE Patent

RUTH H. PATER, inventor (to NASA) 15 Dec. 1992 18 p Filed 5 Feb. 1991 Supersedes N92-11199 (30 - 2, p 218)

(NASA-CASE-LAR-14639-1; US-PATENT-5,171,822; US-PATENT-APPL-SN-651062; US-PATENT-CLASS-528-188; US-PATENT-CLASS-528-125; US-PATENT-CLASS-528-126; US-PATENT-CLASS-528-128; US-PATENT-CLASS-528-170; US-PATENT-CLASS-528-172; US-PATENT-CLASS-528-173) Avail: US Patent and Trademark Office

In-situ polymerization of monomer reactants (PMR) type polyimides constitute an important class of ultra high performance composite matrix resins. PMR-15 is the best known and most widely used PMR polyimide. An object of the present invention is to provide a substantially improved high temperature PMR-15 system that exhibits better processability, toughness, and thermo-oxidative stability than PMR-15, as well as having a low toxicity. Another object is to provide new PMR polyimides that are useful as adhesives, moldings, and composite matrices. By the present invention, a new PMR polyimide comprises a mixture of the following compounds: 3,4'-oxydianiline (3,4'-ODA), NE, and BTDE which are then treated with heat. This PMR was designated LaRC-RP46 and has a broader processing window, better reproducibility of high quality composite parts, better elevated temperature mechanical properties, and higher retention of mechanical properties at an elevated temperature, particularly, at 371 C.

Official Gazette of the U.S. Patent and Trademark Office

N93-17062*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

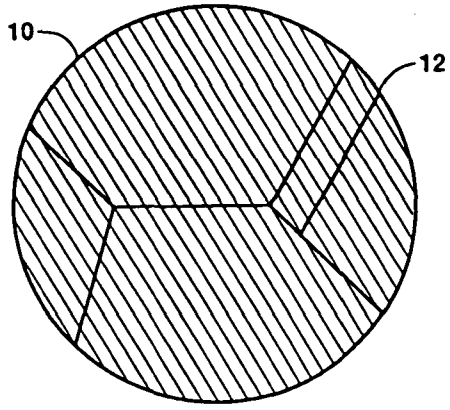
SINTERING SILICON NITRIDE Patent Application

N. P. BANSAL, inventor (to NASA), S. R. LEVINE, inventor (to NASA), and W. A. SANDERS, inventor (to NASA) 27 Nov. 1992 7p

(NASA-CASE-LEW-15489-1; NAS 1.71:LEW-15489-1; US-PATENT-APPL-SN-982535) Avail: CASI HC A02/MF A01

Oxides having a composition of (Ba(1-x)Sr(x))O-Al2O3-2SiO2 are used as sintering aids for producing an improved silicon nitride ceramic material. The x must be greater than 0 to insure the formation of the stable monoclinic celsian glass phase.

NASA



N93-19327* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

HIGH TEMPERATURE POLYMER FROM MALEIMIDE-ACETYLENE TERMINATED MONOMERS Patent

MARGARET K. GERBER, inventor (to NASA) and TERRY L. ST.CLAIR, inventor (to NASA) 23 Feb. 1993 9 p Filed 3 Dec. 1991 Continuation-in-part of abandoned US-Patent-Appl-SN-528666, filed 18 May 1990

(NASA-CASE-LAR-14475-1; US-PATENT-5,189,129; US-PATENT-APPL-SN-801868; US-PATENT-APPL-SN-528666; US-PATENT-CLASS-526-262; US-PATENT-CLASS-526-285; US-PATENT-CLASS-528-322; INT-PATENT-CLASS-C08F-222/40) Avail: US Patent and Trademark Office

Thermally stable, glassy polymeric materials were prepared from maleimide-acetylene terminated monomeric materials by several methods. The monomers were heated to self-polymerize. The A-B structure of the monomer allowed it to polymerize with either bismaleimide monomers/oligomers or bis-acetylene monomers/oligomers. Copolymerization can also take place by mixing bismaleimide and bisacetylene monomers/oligomers with the maleimide-acetylene terminated monomers to yield homogenous glassy polymers.

Official Gazette of the U.S. Patent and Trademark Office

N93-19332*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

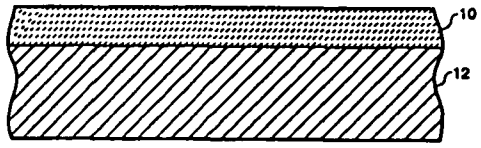
OXIDATION RESISTANT OVERLAY COATINGS FOR LOW EXPANSION SUBSTRATES Patent Application

W. J. BRINDLEY, inventor (to NASA), R. A. MILLER, inventor (to NASA), J. L. SMIALEK, inventor (to NASA), and C. J. ROUGE, inventor (to NASA) 16 Dec. 1992 18 p

(NASA-CASE-LEW-15154-1; NAS 1.71:LEW-15154-1; US-PATENT-APPL-SN-993743) Avail: CASI HC A03/MF A01

A low thermal expansion oxidation resistant coating utilizes an oxidation resistant alloy and an inert low thermal expansion phase which act to reduce overall thermal expansion. This coating is applied to a low thermal expansion substrate.

NASA



N93-19388* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

CROSSLINKED POLYIMIDES PREPARED FROM N-(3-ETHYNYLPHENYL)MALEIMIDE Patent

MARGARET K. GERBER, inventor (to NASA) and TERRY L. ST.CLAIR, inventor (to NASA) 23 Feb. 1993 5 p Filed 3 Dec. 1991 Continuation-in-part of abandoned US-Patent-Appl-SN-528666, filed 18 May 1990

(NASA-CASE-LAR-14774-1; US-PATENT-5,189,127; US-PATENT-APPL-SN-801867; US-PATENT-APPL-SN-528666; US-PATENT-CLASS-526-262; US-PATENT-CLASS-526-285; US-PATENT-CLASS-528-322; INT-PATENT-CLASS-C08F-222/40) Avail: US Patent and Trademark Office

The compound N-(3-ethynylphenyl)maleimide (NEPMI) was used to prepare thermally stable, glassy polyimides which did not exhibit glass transition temperatures below 500 C. NEPMI was blended with the maleimide of methylene dianiline (BMI) and heated to form the polyimide. NEPMI was also mixed with Thermid 600 R, a commercially available bisethynyl oligomeric material, and heated to form a thermally stable, glassy polyimide. Lastly, NEPMI was blended with both BMI and Thermid 600 R to form thermally stable, glassy polyimides.

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28

PROPELLANTS AND FUELS

Includes rocket propellants, igniters, and oxidizers; their storage and handling procedures; and aircraft fuels.

N93-18274* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

PERFORMANCE OF BLASTING CAPS Patent

LAURENCE J. BEMENT, inventor (to NASA), MORRY L. SCHIMMEL, inventor (to NASA) (Schimmel Co., Saint Louis, MO.), and RONNIE B. PERRY, inventor (to NASA) (PRC Kentron, Inc., Hampton, VA.) 12 Jan. 1993 4 p Filed 5 Apr. 1991 Supersedes N91-28444 (29 - 20, p 3330)

(NASA-CASE-LAR-13832-1; US-PATENT-5,179,249; US-PATENT-APPL-SN-682151; US-PATENT-CLASS-102-202.14; US-PATENT-CLASS-102-275.11; INT-PATENT-CLASS-F42B-3/11) Avail: US Patent and Trademark Office

Common blasting caps are made from an aluminum shell in the form of a tube which is closed at both ends. One end, which is called the output end, terminates in a principal side or face, and contains a detonating agent which communicates with a means for igniting the

detonating agent. The improvement of the present invention is a flat, steel foil bonded to the face in a position which is aligned perpendicularly to the longitudinal axis of the tube.

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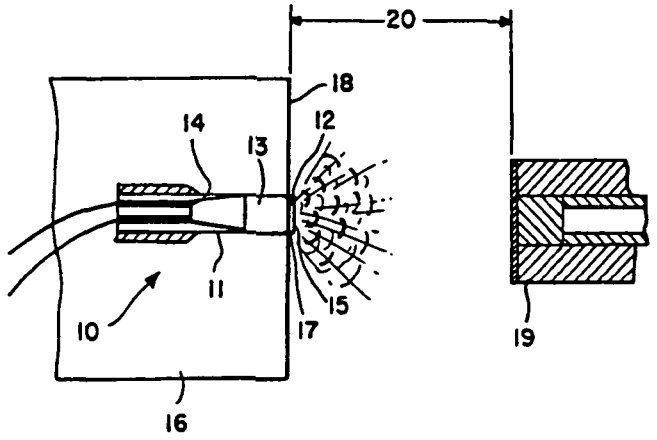


31

ENGINEERING (GENERAL)

Includes vacuum technology; control engineering; display engineering; cryogenics; and fire prevention.

N93-12202*# National Aeronautics and Space Administration. Pasadena Office, CA.

BACKWARD ASSEMBLY PLANNING WITH DFA ANALYSIS ***Patent Application***

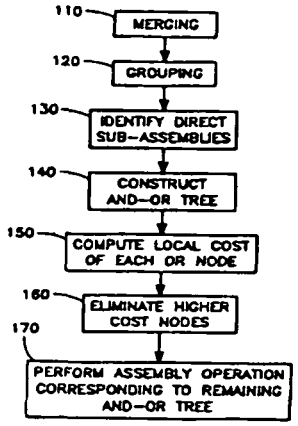
SUKHAN LEE, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 28 Aug. 1992 42 p

(Contract NAS7-918)

(NASA-CASE-NPO-18817-1-CU; NAS 1.71:NPO-18817-1-CU; US-PATENT-APPL-SN-942499) Avail: CASI HC A03/MF A01

An assembly planning system that operates based on a recursive decomposition of assembly into subassemblies is presented. The planning system analyzes assembly cost in terms of stability, directionality, and manipulability to guide the generation of preferred assembly plans. The planning in this system incorporates the special processes, such as cleaning, testing, labeling, etc., that must occur during the assembly. Additionally, the planning handles nonreversible, as well as reversible, assembly tasks through backward assembly planning. In order to decrease the planning efficiency, the system avoids the analysis of decompositions that do not correspond to feasible assembly tasks. This is achieved by grouping and merging those parts that can not be decomposable at the current stage of backward assembly planning due to the requirement of special processes and the constraint of interconnection feasibility. The invention includes methods of evaluating assembly cost in terms of the number of fixtures (or holding devices) and reorientations required for assembly, through the analysis of stability, directionality, and manipulability. All these factors are used in defining cost and heuristic functions for an AO* search for an optimal plan.

NASA



N93-13422* National Aeronautics and Space Administration. Pasadena Office, CA.

THREE-STAGE SORPTION TYPE CRYOGENIC REFRIGERATION SYSTEMS AND METHODS EMPLOYING HEAT REGENERATION Patent

STEVEN BARD, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) and JACK A. JONES, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 27 Oct. 199211 p Filed 22 Oct. 1991 Supersedes N92-17674 (30 - 8, p 1277)

(NASA-CASE-NPO-18366-1-CU; US-PATENT-5,157,938; US-PATENT-APPL-SN-781520; US-PATENT-CLASS-62-335; US-PATENT-CLASS-62-434; US-PATENT-CLASS-62-467; INT-PATENT-CLASS-F25B-1/00) Avail: US Patent and Trademark Office

A three-stage sorption type cryogenic refrigeration system, each stage containing a fluid having a respectively different boiling point, is presented. Each stage includes a compressor in which a respective fluid is heated to be placed in a high pressure gaseous state. The compressor for that fluid which is heated to the highest temperature is enclosed by the other two compressors to permit heat to be transferred from the inner compressor to the surrounding compressors. The system may include two sets of compressors, each having the structure described above, with the interior compressors of the two sets coupled together to permit selective heat transfer therebetween, resulting in more efficient utilization of input power.

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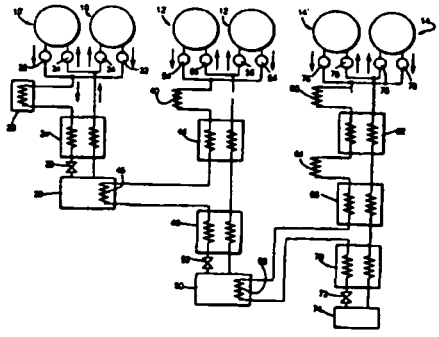

N93-18857* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
INTEGRAL FILL YARN INSERTION AND BEATUP METHOD USING INFLATABLE MEMBRANE Patent
GARY L. FARLEY, inventor (to NASA) 23 Feb. 1993 9 p Filed 26 Sep. 1991 Supersedes N92-11219 (30 - 2, p 222)
(NASA-CASE-LAR-14046-1; US-PATENT-5,188,153; US-PATENT-APPL-SN-766597; US-PATENT-CLASS-139-11; US-PATENT-CLASS-139-DIG.1; US-PATENT-CLASS-139-429; US-PATENT-CLASS-139-436; INT-PATENT-CLASS-D03D-47/14) Avail: US Patent and Trademark Office

An apparatus and method for integral fill yarn insertion and beatup are disclosed. A modified rapier contains a channel for holding fill yarn. The channel is covered with a flexible and inflatable boot, and an inflating apparatus for this boot is also attached. Fill yarn is inserted into the channel, and the rapier is extended into a shed formed by warp yarn. Next, the rapier is pushed into the fell of the fabric, and the flexible and inflatable cover inflated, which both pushes the yarn into the fell of the fabric and performs beatup. The rapier is withdrawn and the shed closed to complete one step of the weaving process.

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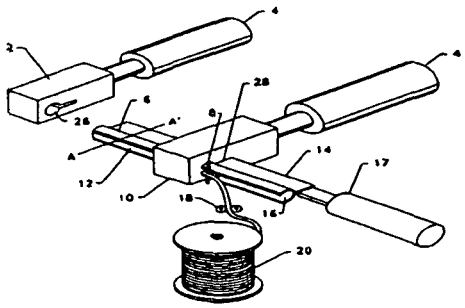


N93-19038*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
METHOD AND APPARATUS FOR THREE DIMENSIONAL BRAIDING Patent Application
GARY L. FARLEY, inventor (to NASA) 29 Sep. 1992 18 p
(NASA-CASE-LAR-14047-1; NAS 1.71:LAR-14047-1; US-PATENT-APPL-SN-953562) Avail: CASI HC A03/MF A01

A machine for three-dimensional braiding of fibers is provided in which carrier members travel on a curved, segmented and movable braiding surface. The carrier members are capable of independent, self-propelled motion along the braiding surface. Carrier member position on the braiding surface is controlled and monitored by computer. Also disclosed is a yarn take-up device capable of maintaining tension in the braiding fiber.

NASA

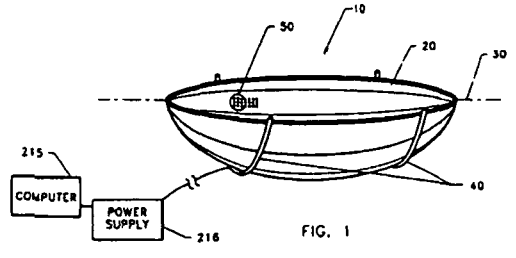


FIG. 1

32

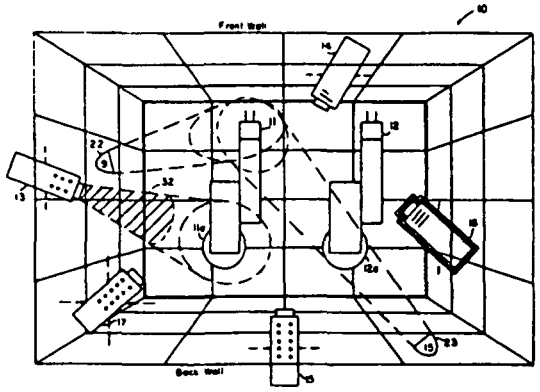
COMMUNICATIONS AND RADAR

Includes radar; land and global communications; communications theory; and optical communications.

N93-18284* National Aeronautics and Space Administration. Pasadena Office, CA.
COMPOSITE VIDEO AND GRAPHICS DISPLAY FOR CAMERA VIEWING SYSTEMS IN ROBOTICS AND TELEOPERATION Patent
DANIEL B. DINER, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) and STEVEN C. VENEMA, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 26 Jan. 1993 11 p Filed 17 Jun. 1991 Supersedes N92-10126 (30 - 1, p 25)
(NASA-CASE-NPO-17836-1-CU; US-PATENT-5,182,641; US-PATENT-APPL-SN-716150; US-PATENT-CLASS-358-103; US-PATENT-CLASS-358-108; US-PATENT-CLASS-358-101; US-PATENT-CLASS-358-181; INT-PATENT-CLASS-H04N-7/18; INT-PATENT-CLASS-H04N-7/00) Avail: US Patent and Trademark Office

system for real-time video image display for robotics or remote-vehicle teleoperation is described that has at least one robot arm or remotely operated vehicle controlled by an operator through hand-controllers, and one or more television cameras and optional lighting element. The system has at least one television monitor for display of a television image from a selected camera and the ability to select one of the cameras for image display. Graphics are generated with icons of cameras and lighting elements for display surrounding the television image to provide the operator information on: the location and orientation of each camera and lighting element; the region of illumination of each lighting element; the viewed region and range of focus of each camera; which camera is currently selected for image display for each monitor; and when the controller coordinate for said robot arms or remotely operated vehicles have been transformed to correspond to coordinates of a selected or nonselected camera.

Official Gazette of the U.S. Patent and Trademark Office



33

ELECTRONICS AND ELECTRICAL ENGINEERING

Includes test equipment and maintainability; components, e.g., tunnel diodes and transistors; microminiaturization; and integrated circuitry.

N93-11456*# National Aeronautics and Space Administration. Pasadena Office, CA.

OVERCHARGE AND OVERDISCHARGE PROTECTION OF AMBIENT TEMPERATURE SECONDARY LITHIUM CELLS Patent Application

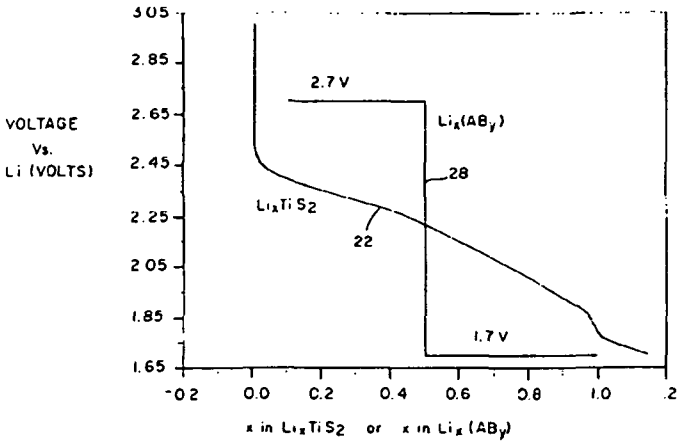
CHEN-KUO HUANG, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), SUBBARAO SURAMPUDI, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), ALAN I. ATTIA, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), and GERALD HALPERT, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 2 Sep. 1992 14 p

(Contract NAS7-918)

(NASA-CASE-NPO-18343-1-CU; NAS 1.71:NPO-18343-1-CU; US-PATENT-APPL-SN-942491) Avail: CASI HC A03/MF A01

A cathode additive is provided for protecting an ambient temperature secondary lithium cell from overcharging or overdischarging. The cathode additive is chosen to create an upper voltage plateau which is slightly higher than a characteristic charge cutoff voltage of the cathode of the cell. The cathode additive additionally creates a lower voltage plateau which is slightly lower than the characteristic discharge cutoff voltage of the cell. Preferably, the cathode additive is a transition metal oxide or a sulfide and may, for example, include a mixture of Li2Mn2O4 and Li(0.1)MoO2.

NASA



N93-17274*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.

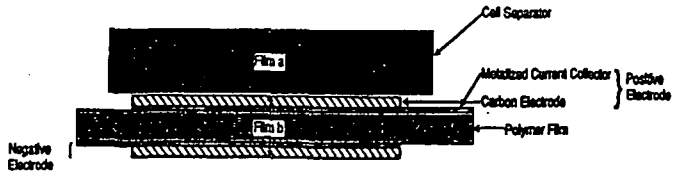
HIGH ENERGY AND HIGH POWER DENSITY ULTRACAPACITORS AND SUPERCAPACITORS Patent Application

CAROL R. LEWIS, inventor (to NASA) and SHIAO-PING S. YEN, inventor (to NASA) 29 Sep. 1992 24 p

(NASA-CASE-NPO-18568-1-CU; NAS 1.71:NPO-18568-1-CU; US-PATENT-APPL-SN-953391) Avail: CASI HC A03/MF A01

Ultracapacitor and supercapacitor designs wherein two discrete metal film current collectors of the prior art, one for each of the cathode and anode, are replaced by a single thin polymer film. The polymer film is typically several microns thick and metallized on both sides. The thickness of the metallization is varied from several hundred to several thousand Angstroms depending upon the particular application. This metallization serves as the positive and negative electrodes (current collectors) which are spatially separated by the polymer dielectric film. The resulting reduction of volume increases the volumetric energy density and the reduction of mass increases the gravimetric energy density. The electrolyte solvent/salt system can be selected to provide useful individual cell voltages as high as 5 volts. The voltage is limited only by the electrolytic stability of the solvent and salt. Ultracapacitors fabricated in accordance with the present invention may have energy densities exceeding 10 watt-hours per kilogram and volumetric energy densities exceeding 15 watt-hours per liter. Values which are yet higher are feasible with supercapacitors fabricated in accordance with the present invention.

NASA



N93-17277*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.

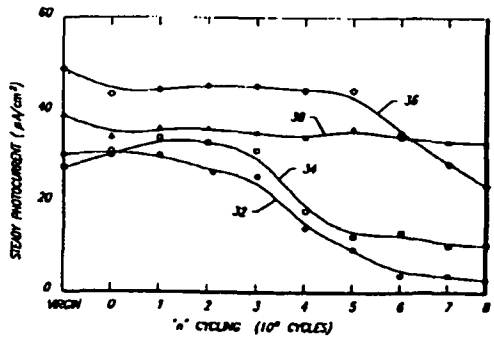
ENHANCED FATIGUE AND RETENTION IN FERROELECTRIC THIN FILM MEMORY CAPACITORS BY POST-TOP ELECTRODE ANNEAL TREATMENT Patent Application

SARITA THAKOOR, inventor (to NASA) 20 Oct. 1992 23 p

(NASA-CASE-NPO-18551-1-CU; NAS 1.71:NPO-18551-1-CU; US-PATENT-APPL-SN-963974) Avail: CASI HC A03/MF A01

Thin film ferroelectric capacitors comprising a ferroelectric film sandwiched between electrodes for nonvolatile memory operations are rendered more stable by subjecting the capacitors to an anneal following deposition of the top electrode. The anneal is done so as to form the interface between the ferroelectric film and the top electrode. Heating in an air oven, laser annealing, or electron bombardment may be used to form the interface. Heating in an air oven is done at a temperature at least equal to the crystallization temperature of the ferroelectric film. Where the ferroelectric film comprises lead zirconate titanate, annealing is done at about 550 to 600 C for about 10 to 15 minutes. The formation treatment reduces the magnitude of charge associated with the nonswitching pulse in the thin film ferroelectric capacitors. Reduction of this charge leads to significantly more stable nonvolatile memory operations in both digital and analog memory devices. The formation treatment also reduces the ratio of change of the charge associated with the nonswitching pulse as a function of retention time. These improved memory devices exhibit greater performance in retention and reduced fatigue in memory arrays.

NASA



N93-17278*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.

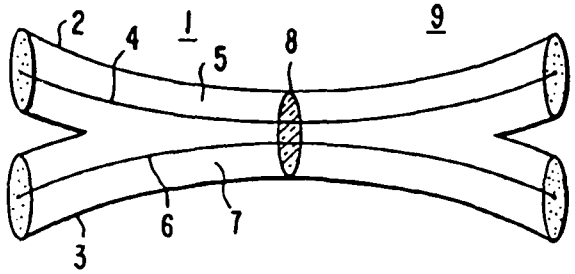
ANODE FOR RECHARGEABLE AMBIENT TEMPERATURE LITHIUM CELLS Patent Application

CHEN-KUO HUANG, inventor (to NASA), SUBBARAO SURAMPUDI, inventor (to NASA), ALAN I. ATTIA, inventor (to NASA), and GERALD HALPERT, inventor (to NASA) 13 Oct. 1992 15 p

(NASA-CASE-NPO-18580-1-CU; NAS 1.71:NPO-18580-1-CU; US-PATENT-APPL-SN-959858) Avail: CASI HC A03/MF A01

An ambient room temperature, high density, rechargeable lithium battery includes a Li(x)Mg2Si negative anode which intercalates lithium to form a single crystalline phase when x is up to 1.0 and an amorphous phase when x is from 1 to 2.0. The electrode has good reversibility and mechanical strength after cycling.

NASA



N93-18278* National Aeronautics and Space Administration. Pasadena Office, CA.

CASCADED TRANSFORMERLESS DC-DC VOLTAGE AMPLIFIER WITH OPTICALLY ISOLATED SWITCHING DEVICES Patent

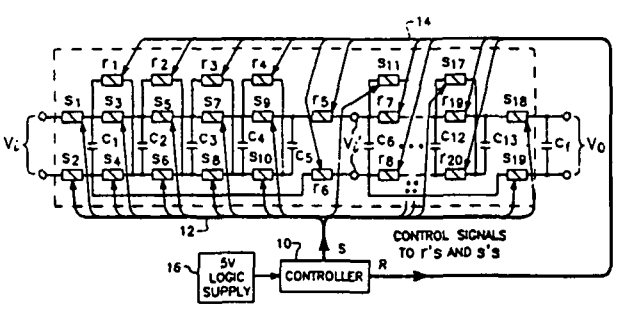
GOVIND SRIDHARAN, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 12 Jan. 1993 6 p Filed 22 Oct. 1991 Supersedes N92-17907 (30 - 8, p 1293)

(ContractNAS7-918)

(NASA-CASE-NPO-17994-1-CU; US-PATENT-5,179,289; US-PATENT-APPL-SN-791759; US-PATENT-CLASS-307-110; US-PATENT-CLASS-363-60; INT-PATENT-CLASS-H02M-3/07) Avail: US Patent and Trademark Office

A very high voltage amplifier is provided in which plural cascaded banks of capacitors are switched by optically isolated control switches so as to be charged in parallel from the preceding stage or capacitor bank and to discharge in series to the succeeding stage or capacitor bank in alternating control cycles. The optically isolated control switches are controlled by a logic controller whose power supply is virtually immune to interference from the very high voltage output of the amplifier by the optical isolation provided by the switches, so that a very high voltage amplification ratio may be attained using many capacitor banks in cascade.

Official Gazette of the U.S. Patent and Trademark Office



N93-18285* National Aeronautics and Space Administration. Pasadena Office, CA.

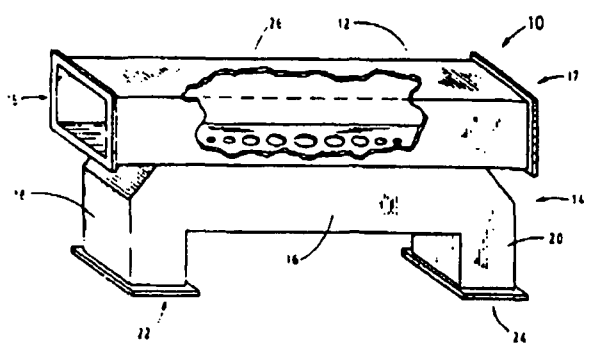
METHOD FOR NON-DESTRUCTIVE ESTIMATION OF WAVEGUIDE DIRECTIONAL COUPLER DIMENSIONS Patent

RAUL M. PEREZ, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 9 Feb. 1993 6 p Filed 22 Oct. 1991 Supersedes N92-17865 (30 - 8, p 1293)

(NASA-CASE-NPO-18454-1-CU; US-PATENT-5,185,046; US-PATENT-APPL-SN-781521; US-PATENT-CLASS-156-64; US-PATENT-CLASS-156-279; INT-PATENT-CLASS-B32B-31/00) Avail: US Patent and Trademark Office

A method for estimating the size and location of couplings within a waveguide directional coupler is provided. The method is applied to a waveguide directional coupler having a main transmission waveguide connected to an auxiliary transmission waveguide by a number of bore hold couplings. The bore hold couplings are in the interior of the waveguide directional coupler and, therefore, are not easily measurable. The method generally includes the steps of applying a two-sided tape to a member, inserting and securing the member within the main transmission waveguide, pouring a fine particulate substance such as talc into the auxiliary transmission waveguide such that a portion of the talc enters the bore hole couplings and adheres to the two-sided tape, and withdrawing the member such that the size and location of the bore hole couplings can be determined by measuring the size and location of marks on the two-sided tape caused by the fine particular substance adhering to the two-sided tape.

Official Gazette of the U.S. Patent and Trademark Office



N93-19051*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

PROCESS FOR APPLYING A SUPERCONDUCTIVE POWDER TO A WIDE VARIETY OF SUBSTRATES Patent Application

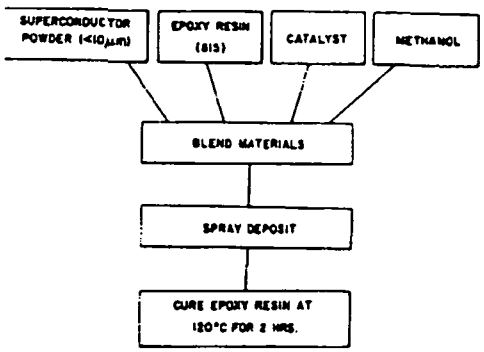
MATTHEW W. HOOKER, inventor (to NASA) (Clemson Univ., SC.), STEPHANIE A. WISE, inventor (to NASA), and SANG Q. TRAN, inventor (to NASA) 17 Dec. 1992 9 p

(NASA-CASE-LAR-14729-1-CU; NAS 1.71:LAR-14729-1-CU; US-PATENT-APPL-SN-999695) Avail: CASI HC A02/MF A01

A fine superconducting powder such as YBa2Cu3O(7-x), wherein x is less than one, is blended into a liquid mixture comprising an epoxy resin and a thinner. This liquid mixture with the blended superconducting powder is coated onto a substrate. Next, the thinner is evaporated and the remaining coating cured, resulting in a coating of cured epoxy resin having superconducting powder suspended therein. This coating exhibits the Meissner effect, i.e., it expels a magnetic flux which protects the substrate from external magnetic

interference. Since the coated substrate need only be heated for evaporation and curing at relatively low temperatures compared to firing, the superconducting coating can be applied to a wide variety of different materials.

NASA



N93-19330*# National Aeronautics and Space Administration. Pasadena Office, CA.

AMTEC VAPOR-VAPOR SERIES CONNECTED CELLS Patent Application

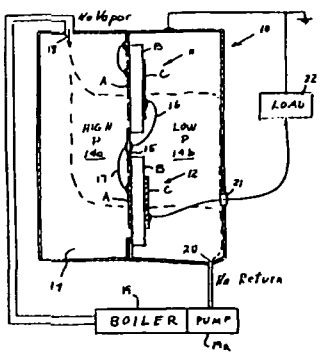
MARK L. UNDERWOOD, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), ROBERT M. WILLIAMS, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), MARGARET A. RYAN, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), BARBARA JEFFRIES-NAKAMURA, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), and DENNIS OCONNOR, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 11 Jan. 1993 21 p

(Contract NAS7-918)

(NASA-CASE-NPO-18667-1-CU; NAS 1.71:NPO-18667-1-CU; US-PATENT-APPL-SN-004162) Avail: CASI HC A03/MF A01

An alkali metal thermoelectric converter (AMTEC) having a plurality of cells structurally connected in series to form a septum dividing a plenum into two chambers, and electrically connected in series, is provided with porous metal anodes and porous metal cathodes in the cells. The cells may be planar or annular, and in either case a metal alkali vapor at a high temperature is provided to the plenum through one chamber on one side of the wall and returned to a vapor boiler after condensation at a chamber on the other side of the wall in the plenum. If the cells are annular, a heating core may be placed along the axis of the stacked cells. This arrangement of series-connected cells allows efficient generation of power at high voltage and low current.

NASA



34

FLUID MECHANICS AND HEAT TRANSFER

Includes boundary layers; hydrodynamics; fluidics; mass transfer; and ablation cooling.

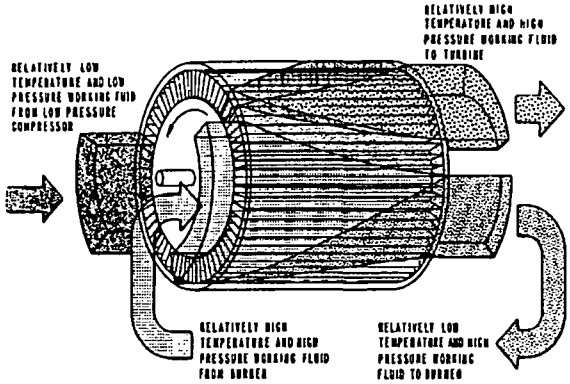
N93-11172*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

SYSTEM AND METHOD FOR CANCELLING EXPANSION WAVES IN A WAVE ROTOR Patent Application

DANIEL E. PAXSON, inventor (to NASA) 26 May 1992 17 p (NASA-CASE-LEW-15218-1; NAS 1.71:LEW-15218-1; US-PATENT-APPL-SN-889003) Avail: CASI HC A03/MF A01

A wave rotor system that is comprised of a wave rotor coupled to first and second plates is described. Special ports are provided, one in each of the first and second end plates, to cancel expansion waves generated by the release of working fluid from the wave rotor. One of the expansion waves is reflected in the wave rotor from a reflecting portion and provided to the special port in the second end plate. Fluid present at the special port in the second end plate has a stagnation pressure and mass flow which is the same as that of the cells of the wave rotor communicating with such special port. This allows for cancellation of the expansion wave generated by the release of working fluid from the wave rotor. The special port in the second end plate has a first end corresponding to the head of the expansion wave and a second end corresponding to the tail of the expansion wave. Also, the special port is configured to continually change along the circumference of the second end plate to affect expansion wave cancellation. An expansion wave generated by a second release of working fluid from the wave rotor is cancelled in a similar manner to that described above using a special port in the first end plate. The cycle of operation of the wave rotor system is designed so that the stagnation pressure and mass flow of the fluid present at the special ports is the same so that the special ports may be connected by a common duct.

NASA



N93-17039*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

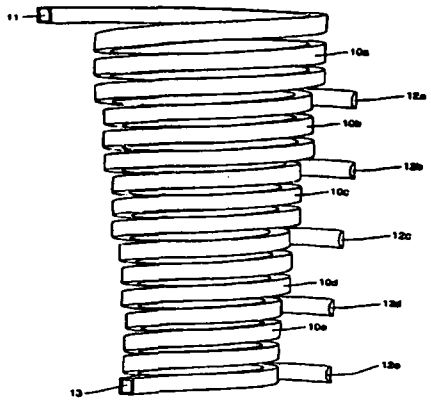
FLUID SEPARATOR Patent Application

GLEN A. ROBERTSON, inventor (to NASA) 9 Oct. 1992 11 p (NASA-CASE-MFS-28658-1; NAS 1.71:MFS-28658-1; US-PATENT-APPL-SN-958843) Avail: CASI HC A03/MF A01

A fluid separator for separating particulate matter such as contaminates is provided which includes a series of spiral tubes of progressively decreasing cross sectional area connected in series. Each tube has an outlet on the outer curvature of the spiral. As fluid spirals down a tube, centrifugal force acts to force the heavier

particulate matter to the outer wall of the tube, where it exits through the outlet. The remaining, and now cleaner, fluid reaches the next tube, which is smaller in cross sectional area, where the process is repeated. The fluid which comes out the final tube is diminished of particulate matter.

NASA



35

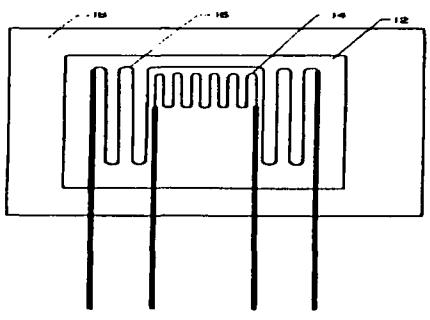
INSTRUMENTATION AND PHOTOGRAPHY

Includes remote sensors; measuring instruments and gages; detectors; cameras and photographic supplies; and holography.

N93-12205*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
COMPENSATED HIGH TEMPERATURE STRAIN GAGE Patent Application
THOMAS C. MOORE, SR., inventor (to NASA) 12 Aug. 1992 10p (NASA-CASE-LAR-14776-1; NAS 1.71:LAR-14776-1; US-PATENT-APPL-SN-928865) Avail: CASI HC A02/MF A01

A device for measuring strain in substrates at high temperatures, in which the thermally induced apparent strain is nulled, is presented. Two gages are used: one active gage and one compensating gage. Both gages are placed on the substrate to be gaged; the active gage is attached such that it responds to mechanical and thermally induced apparent strain while the compensating gage is attached such that it does not respond to mechanical strain and measures only thermally induced apparent strain. A thermal blanket is placed over the two gages to maintain the gages at the same temperature. The two gages are wired as adjacent arms of a Wheatstone bridge which nulls the thermally induced apparent strain giving a true reading of the mechanical strain in the substrate.

NASA



N93-14714* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
METHOD OF FORMING A MULTIPLE LAYER DIELECTRIC AND A HOT FILM SENSOR THEREWITH Patent
PURNELL HOPSON, JR., inventor (to NASA) and SANG Q. TRAN, inventor (to NASA) 27 Oct. 1992 8 p Filed 15 Apr. 1991 Continuation-in-part of abandoned US-Patent-Appl-SN-458214, filed 28 Dec. 1989 Division of US-Patent-Appl-SN-176547, filed 1 Apr. 1988
(NASA-CASE-LAR-13678-3; US-PATENT-5,158,801; US-PATENT-APPL-SN-688361; US-PATENT-CLASS-427-58; US-PATENT-CLASS-427-255; US-PATENT-CLASS-427-344; US-PATENT-CLASS-427-527; US-PATENT-CLASS-427-255.7; US-PATENT-CLASS-427-248.1; US-PATENT-CLASS-427-255.6) Avail:US Patent and Trademark Office

The invention is a method of forming a multiple layer dielectric for use in a hot-film laminar separation sensor. The multiple layer dielectric substrate is formed by depositing a first layer of a thermoplastic polymer such as on an electrically conductive substrate such as the metal surface of a model to be tested under cryogenic conditions and high Reynolds numbers. Next, a second dielectric layer of fused silica is formed on the first dielectric layer of thermoplastic polymer. A resistive metal film is deposited on selected areas of the multiple layer dielectric substrate to form one or more hot-film sensor elements to which aluminum electrical circuits deposited upon the multiple layered dielectric substrate are connected.

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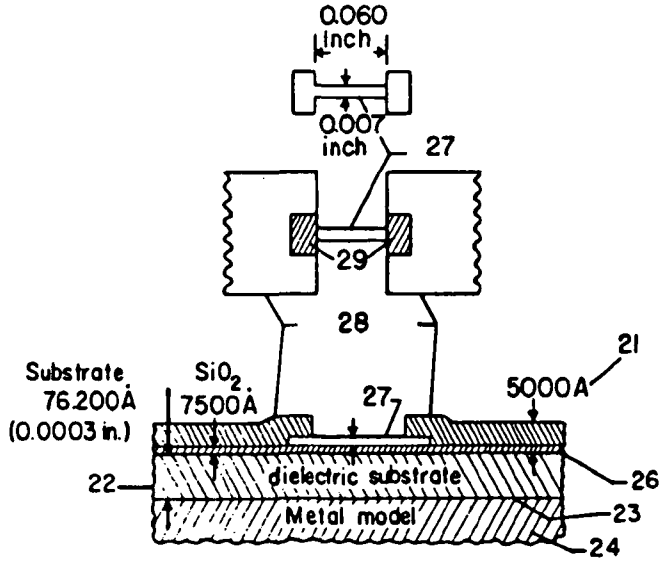
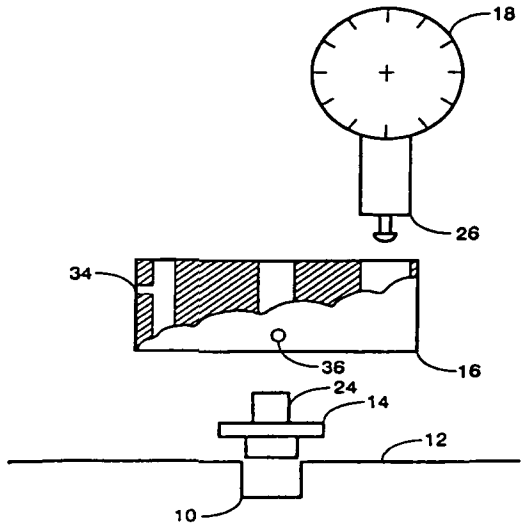


N93-14840*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
APPARATUS FOR CHECKING THREADED HOLE PERPENDICULARITY Patent Application
AUGUST R. SCARPELLI, inventor (to NASA) 21 Sep. 1992 9 p (NASA-CASE-LEW-15444-1; US-PATENT-APPL-SN-947597) Avail: CASI HC A02/MF A01

A simple assembly for checking the perpendicularity of a hole relative to a datum surface is described. A 'go' plug is inserted into the hole and serves as a mounting stand for a cylindrical disk which houses an indicator. The indicator is then rotated 360 deg while checking for any deflection of the indicator that would signal the hole is not perpendicular.

NASA



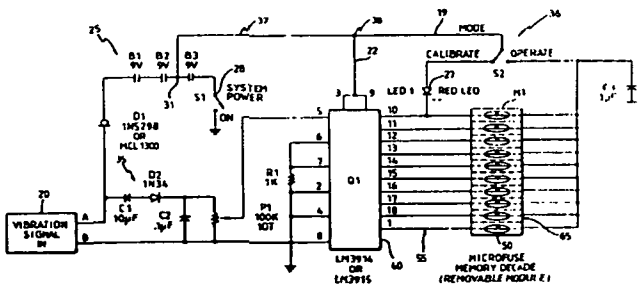
N93-14841*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

SYSTEM FOR MEMORIZING MAXIMUM VALUES Patent Application

RICHARD J. BOZEMAN, JR., inventor (to NASA) 3 Aug. 1992 15p (NASA-CASE-MSC-21922-1; US-PATENT-APPL-SN-924213) Avail: CASI HC A03/MF A01

The invention discloses a system capable of memorizing maximum sensed values. The system includes conditioning circuitry which receives the analog output signal from a sensor transducer. The conditioning circuitry rectifies and filters the analog signal and provides an input signal to a digital driver, which may be either linear or logarithmic. The driver converts the analog signal to discrete digital values, which in turn triggers an output signal on one of a plurality of driver output lines n. The particular output lines selected is dependent on the converted digital value. A microfuse memory device connects across the driver output lines, with n segments. Each segment is associated with one driver output line, and includes a microfuse that is blown when a signal appears on the associated driver output line.

NASA



N93-17041*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

SYSTEM FOR DETERMINING THE ANGLE OF IMPACT OF AN OBJECT ON A STRUCTURE Patent Application

WILLIAM H. PROSSER, investor (to NASA) and MICHAEL R. GORMAN, inventor (to Navy) 17 Jun. 1992 13 p (NASA-CASE-LAR-14817-1; NAS 1.71:LAR-14817-1; US-PATENT-APPL-SN-903708) Avail: CASI HC A03/MF A01

A method for determining the angle of impact of an object on a thin-walled structure which determines the angle of impact through analysis of the acoustic waves which result when an object impacts a structure is presented. Transducers are placed on and in the surface of the structure which sense the wave caused in the structure by impact. The waves are recorded and saved for analysis. For source motion normal to the surface, the antisymmetric mode has a large amplitude while that of the symmetric mode is very small. As the source angle increases with respect to the surface normal, the symmetric mode amplitude increases while the antisymmetric mode amplitude decreases. Thus, the angle of impact is determined by measuring the relative amplitudes of these two lowest order modes.

NASA

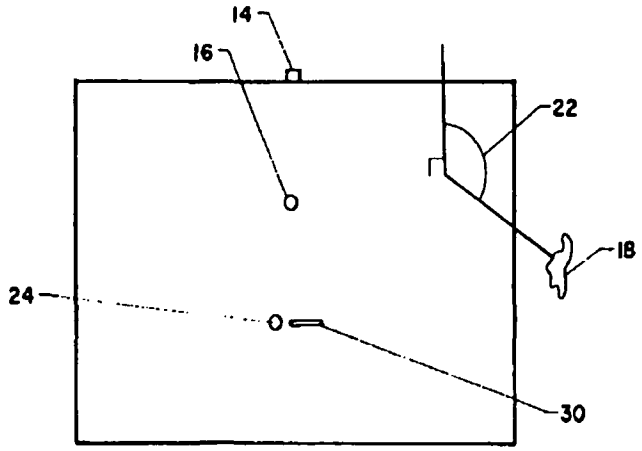


FIG. 1

N93-17060*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

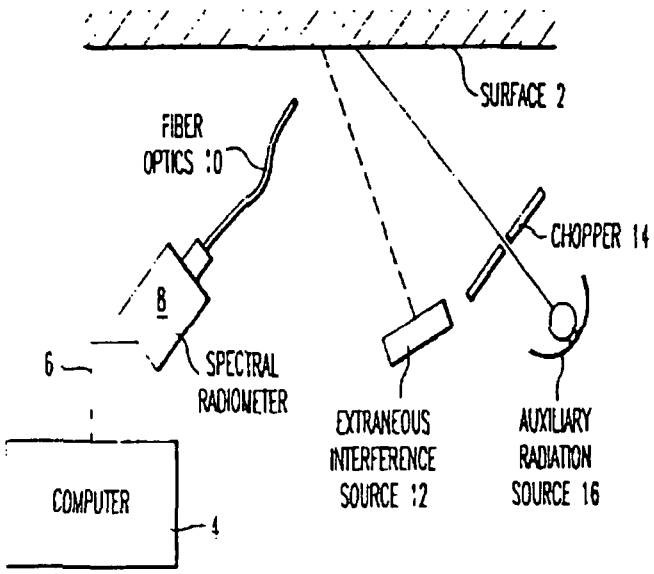
MULTIWAVELENGTH PYROMETER FOR GRAY AND NON-GRAY SURFACES IN THE PRESENCE OF INTERFERING RADIATION Patent Application

DANIEL NG, inventor (to NASA) 14 Dec. 1992 26 p (NASA-CASE-LEW-15250-1; NAS 1.71:LEW-15250-1; US-PATENT-APPL-SN-991403) Avail: CASI HC A03/MF A01

A method and apparatus for detecting the temperature of gray and non-gray bodies in the presence of interfering radiation are presented. A gray body has a constant emissivity less than 1 and a non-gray body has an emissivity which varies with wavelength. The emissivity and reflectivity of the surface is determined over a range of wavelengths. Spectra are also measured of the extraneous interference radiation source and the surface of the object to be measured in the presence of the extraneous interference radiation source. An auxiliary radiation source is used to determine the reflectivity of the surface and also the emissivity. The measured spectrum of the surfaces in the presence of the extraneous interference radiation source is set equal to the emissivity of the surface multiplied by a

Planck function containing a temperature term T plus the surface reflectivity multiplied by the spectrum of the extraneous interference radiation source. The equation is then solved for T to determine the temperature of the surface.

NASA



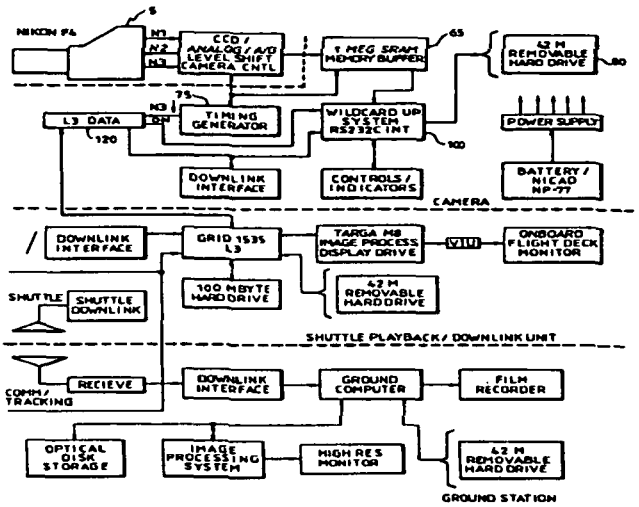
N93-17076*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

ELECTRONIC STILL CAMERA Patent Application

S. DOUGLAS HOLLAND, inventor (to NASA) 10 Sep. 1992 103 p (NASA-CASE-MSC-21797-1; NAS 1.71:MSC-21797-1; US-PATENT-APPL-SN-943168) Avail: CASI HC A06/MF A02

A handheld, programmable, digital camera is disclosed that supports a variety of sensors and has program control over the system components to provide versatility. The camera uses a high performance design which produces near film quality images from an electronic system. The optical system of the camera incorporates a conventional camera body that was slightly modified, thus permitting the use of conventional camera accessories, such as telephoto lenses, wide-angle lenses, auto-focusing circuitry, auto-exposure circuitry, flash units, and the like. An image sensor, such as a charge coupled device ('CCD') collects the photons that pass through the camera aperture when the shutter is opened, and produces an analog electrical signal indicative of the image. The analog image signal is read out of the CCD and is processed by preamplifier circuitry, a correlated double sampler, and a sample and hold circuit before it is converted to a digital signal. The analog-to-digital converter has an accuracy of eight bits to insure accuracy during the conversion. Two types of data ports are included for two different data transfer needs. One data port comprises a general purpose industrial standard port and the other a high speed/high performance application specific port. The system uses removable hard disks as its permanent storage media. The hard disk receives the digital image signal from the memory buffer and correlates the image signal with other sensed parameters, such as longitudinal or other information. When the storage capacity of the hard disk has been filled, the disk can be replaced with a new disk.

NASA



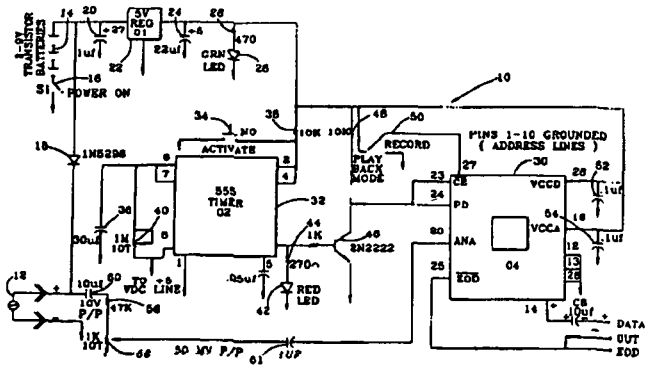
N93-17077*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

ACCELERATION RECORDER AND PLAYBACK MODULE Patent Application

RICHARD J. BOZEMAN, JR., inventor (to NASA) 3 Sep. 1992 22p (NASA-CASE-MSC-22008-1; NAS 1.71:MSC-22008-1; US-PATENT-APPL-SN-940420) Avail: CASI HC A03/MF A01

The present invention is directed to methods and apparatus relating to an accelerometer electrical signal recorder and playback module. The recorder module may be manufactured in lightweight configuration and includes analog memory components to store data. Signal conditioning circuitry is incorporated into the module so that signals may be connected directly from the accelerometer to the recorder module. A battery pack may be included for powering both the module and the accelerometer. Timing circuitry is included to control the time duration within which data is recorded or played back so as to avoid overloading the analog memory components. Multiple accelerometer signal recordings may be taken simultaneously without analog to digital circuits, multiplexing circuitry or software to compensate for the effects of multiplexing the signals.

NASA



N93-17626* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

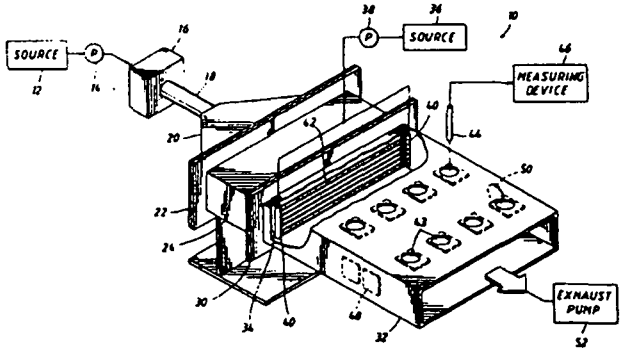
ATMOSPHERIC PRESSURE FLOW REACTOR: GAS PHASE CHEMICAL KINETICS UNDER TROPOSPHERIC CONDITIONS WITHOUT WALL EFFECTS Patent

STEVEN L. KOONTZ, inventor (to NASA) and DENNIS D. DAVIS, inventor (to NASA) 12 Jan. 1993 5 p Filed 30 Jul. 1991 Division of US-Patent-Appl-SN-279170, filed 2 Dec. 1988

(NASA-CASE-MSC-21384-2; US-PATENT-5,179,025; US-PATENT-APPL-SN-737756; US-PATENT-CLASS-436-52; US-PATENT-CLASS-436-9; US-PATENT-CLASS-436-117; US-PATENT-CLASS-422-83; US-PATENT-CLASS-422-93; US-PATENT-CLASS-422-110; INT-PATENT-CLASS-G01N-35/08) Avail: US Patent and Trademark Office

A flow reactor for simulating the interaction in the troposphere is set forth. A first reactant mixed with a carrier gas is delivered from a pump and flows through a duct having louvers therein. The louvers straighten out the flow, reduce turbulence, and provide laminar flow discharge from the duct. A second reactant delivered from a source through a pump is input into the flowing stream, the second reactant being diffused through a plurality of small diffusion tubes to avoid disturbing the laminar flow. The commingled first and second reactants in the carrier gas are then directed along an elongate duct where the walls are spaced away from the flow of reactants to avoid wall interference, disturbance, or turbulence arising from the walls. A probe connected with a measuring device can be inserted through various sampling ports in the second duct to complete measurements of the first and second reactants and the product of their reaction at selected XYZ locations relative to the flowing system.

Official Gazette of the U.S. Patent and Trademark Office



N93-19328*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

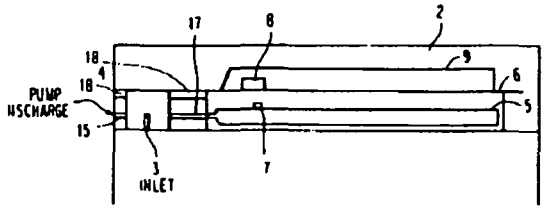
***FLOW RATE LOGGING SEEPAGE METER* Patent Application**

WILLIAM G. REAY, inventor (to NASA) (Virginia Polytechnic Inst. and State Univ., Blacksburg.) and HARRY G. WALTHALL, inventor (to NASA) 7 Dec. 1992 16 p

(NASA-CASE-LAR-14835-1; NAS 1.71:LAR-14835-1; US-PATENT-APPL-SN-988077) Avail: CASI HC A03/MF A01

An apparatus for remotely measuring and logging the flow rate of groundwater seepage into surface water bodies is described. As groundwater seeps into a cavity created by a bottomless housing, it displaces water through an inlet and into a waterproof sealed upper compartment, at which point, the water is collected by a collection bag, which is contained in a bag chamber. A magnet on the collection bag approaches a proximity switch as the collection bag fills, and eventually enables the proximity switch to activate a control circuit. The control circuit then rotates a three-way valve from the collection path to a discharge path, enables a data logger to record the time, and enables a pump, which discharges the water from the collection bag, through the three-way valve and pump, and into the sea. As the collection bag empties, the magnet leaves the proximity of the proximity switch, and the control circuit turns off the pump, resets the valve to provide a collection path, and restarts the collection cycle.

NASA



N93-19387* National Aeronautics and Space Administration. Pasadena Office, CA.

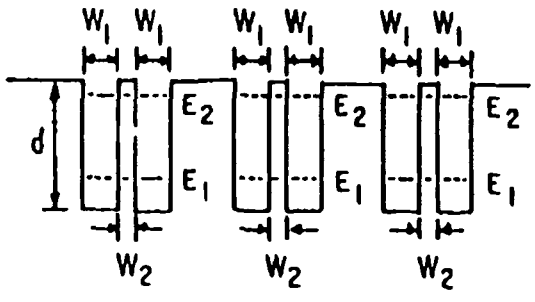
LONG WAVELENGTH INFRARED DETECTOR Patent

RICHARD P. VASQUEZ, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 9 Feb. 1993 6 p Filed 25 Sep. 1990 *Continuation-in-part of abandoned US-Patent-Appl-SN-283443, filed 12 Dec. 1988*

(NASA-CASE-NPO-17543-2-CU; US-PATENT-5,185,647; US-PATENT-APPL-SN-562176; US-PATENT-APPL-SN-283443; US-PATENT-CLASS-257-17; US-PATENT-CLASS-257-21; US-PATENT-CLASS-257-23; INT-PATENT-CLASS-H01L-27/12; INT-PATENT-CLASS-H01L-29/161; INT-PATENT-CLASS-H01L-27/14) Avail: US Patent and Trademark Office

Long wavelength infrared detection is achieved by a detector made with layers of quantum well material bounded on each side by barrier material to form paired quantum wells, each quantum well having a single energy level. The width and depth of the paired quantum wells, and the spacing therebetween, are selected to split the single energy level with an upper energy level near the top of the energy wells. The spacing is selected for splitting the single energy level into two energy levels with a difference between levels sufficiently small for detection of infrared radiation of a desired wavelength.

Official Gazette of the U.S. Patent and Trademark Office



N93-19492*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

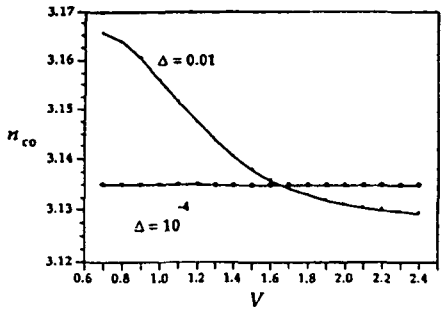
DISCRETE OPTICAL FIBER STRAIN SENSOR Patent Application

CLAUDIO OLIVEIRA EGALON, inventor (to NASA) (Analytical Services and Materials, Inc., Hampton, VA.) and ROBERT S. ROGOWSKI, inventor (to NASA) 21 Dec. 1992 15 p

(NASA-CASE-LAR-14810-1-SB; NAS 1.71:LAR-14810-1-SB; US-PATENT-APPL-SN-999696) Avail: CASI HC A03/MF A01

A strain sensor uses an optical fiber including a strain sensitive portion and at least one strain insensitive portion. The strain sensitive portion is mounted on the surface of a structure at a location where a strain is desired to be measured. The strain insensitive portion(s) may be fused to the strain sensitive portion to transmit light therethrough, so that the resulting pattern may be detected to determine the amount of strain by comparison with a similar fiber not subjected to strain, or with the light pattern produced when the fiber is not under strain.

NASA



N93-19493*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

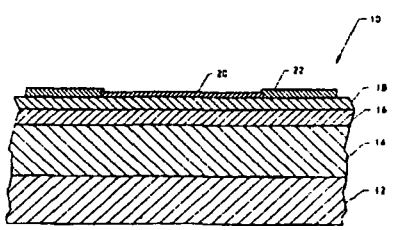
MULTIPLE LAYER DIELECTRICS, HOT FILM SENSORS, AND METHODS OF PRODUCING SAME Patent Application

SANG Q. TRAN, inventor (to NASA), BENJAMIN M. COPELAND, JR., inventor (to NASA), and MICHAEL T. OLIVER, inventor (to NASA) 31 Aug. 1992 13 p

(NASA-CASE-LAR-14591-1; NAS 1.71:LAR-14591-1; US-PATENT-APPL-SN-957014) Avail: CASI HC A03/MF A01

The invention is a method of forming metal designs such as hot film sensors on a composite surface according to the present invention. The outer composite layer is an epoxy resin which is shaped to a desired surface on an underlying metal layer. The epoxy resin is bombarded with an ion beam for a brief period and then a fused silica layer is simultaneously vapor deposited thereon via an electron beam. The fused silica and epoxy resin form a dielectric over the metal layer. A sensor design mask is then positioned over the newly deposited fused silica. The exposed portion of the fused silica layer is then bombarded with an ion beam for a brief period of time and then a metal layer is simultaneously vapor deposited thereon via an electron beam. Thin film leads leading to a data acquisition system are then connected to the metal sensor and fused silica layer in a similar manner. All operations employing the ion beam and electron beam were conducted in a vacuum environment.

NASA



36

LASERS AND MASERS

Includes parametric amplifiers.

N93-13418* National Aeronautics and Space Administration. Pasadena Office, CA.

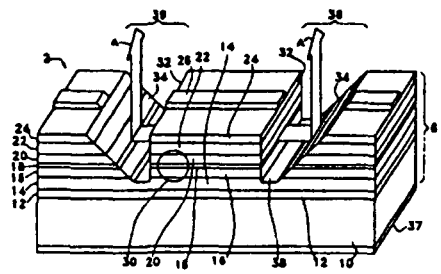
QUANTUM WELL, BEAM DEFLECTING SURFACE EMITTING LASERS Patent

JAE H. KIM, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 27 Oct. 1992 7 p Filed 5 Jun. 1991 Supersedes N91-32489 (29 - 24, p 4024)

(NASA-CASE-NPO-18243-1-CU; US-PATENT-5,159,603; US-PATENT-APPL-SN-710424; US-PATENT-CLASS-372-45; US-PATENT-CLASS-372-46; INT-PATENT-CLASS-H01S-3/19) Avail: US Patent and Trademark Office

This invention relates to surface emitting semiconductor lasers (SELs), with integrated 45 deg. beam deflectors. A SEL is formed on a wafer including vertical mirrors and 45 deg. beam deflectors formed in grooves by tilted ion beam etching. A SEL is a lattice matched, or unstrained, AlGaAs/GaAs GRINSCH SQW SEL. An alternate embodiment is shown, in which a SEL is lattice mismatched, strained or pseudomorphic, or InGaAs/AlGaAs GRINSCH SQW SEL which emits radiation at a wavelength to which its substrate is transparent. Both SELs exhibit high output power, low threshold current density, and relatively high efficiency, and each are processing compatible with conventional large scale integration technology. Such SELs may be fabricated in large numbers from single wafers. The novel features of this invention include the use of tilted ion beam etching to form a pair of grooves each including vertical mirrors and 45 deg. beam deflectors. The embodiment provides substantial circuit design flexibility because radiation may be coupled both up and/or down through the substrate.

Official Gazette of the U.S. Patent and Trademark Office



N93-14703* National Aeronautics and Space Administration. Pasadena Office, CA.

MULTIPERIOD-GRATING SURFACE-EMITTING LASERS Patent

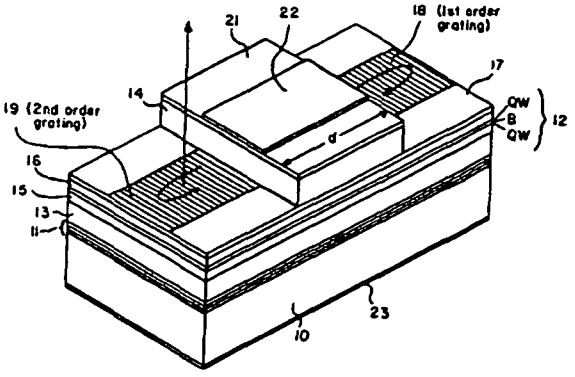
ROBERT J. LANG, inventor (to NASA) 17 Nov. 1992 12 p Filed 21 Oct. 1991 Supersedes N92-17862 (30 - 8, p 1305) Prepared in cooperation with Jet Propulsion Lab., California Inst. of Tech., Pasadena.

(NASA-CASE-NPO-17763-1-CU; US-PATENT-5,164,956; US-PATENT-APPL-SN-782009; US-PATENT-CLASS-372-96; US-PATENT-CLASS-372-20; US-PATENT-CLASS-372-108; INT-PATENT-CLASS-H01S-3/19) Avail:US Patent and Trademark Office

Surface-emitting distributed feedback (DFB) lasers are disclosed with hybrid gratings. A first-order grating is provided at one or both ends of the active region of the laser for retroreflection of light back into the active region, and a second-order or nonresonant grating is provided at the opposite end for coupling light out perpen-

dicular to the surfaces of the laser or in some other selected direction. The gratings may be curved to focus light retroreflected into the active region and to focus light coupled out to a point. When so focused to a point, the DFB laser may be part of a monolithic read head for a laser recorded disk, or an optical coupler into an optical fiber.

Official Gazette of the U.S. Patent and Trademark Office



N93-18277* National Aeronautics and Space Administration. Pasadena Office, CA.

SELF-COLLIMATED UNSTABLE RESONATOR SEMICONDUCTOR LASER Patent

ROBERT J. LANG, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 12 Jan. 1993 8 p *Filed* 28 Aug. 1991 Supersedes 92N-17899 (30 - 8, p 1305)

(Contract NAS7-918)

(NASA-CASE-NPO-18386-1CU;US PATENT-5,179,568; US-PATENT-APPL-SN-751440; US-PATENT-CLASS-372-95; INT-PATENT-CLASS-H01S-3/08) Avail: US Patent and Trademark Office

Self-collimation of the output is achieved in an unstable resonator semiconductor laser by providing a large concave mirror M sub 1 and a small convex mirror M sub 2 on opposite surfaces of a semiconductor body of a material having an effective index of refraction denoted by n, where the respective mirror radii R sub 1, R sub 2 and beam radii r sub 1, r sub 2 are chosen to satisfy a condition (R sub 2)/(1 + r sub 1) = (n - 1)/n, with a value of geometric magnification 1 less than or equal to M less than or equal to (n + 1)/(n - 1) where r sub 1 and r sub 2 are the radii of counterpropagating beams at respective mirrors of radii R sub 1 and R sub 2.

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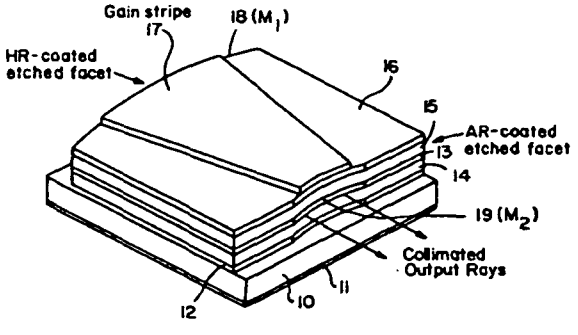

N93-18287* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

DOPPLER SHIFT COMPENSATION SYSTEM FOR LASER TRANSMITTERS AND RECEIVERS Patent

GEARY K. SCHWEMMER, inventor (to NASA) 2 Feb. 1993 10 p Filed 21 Jun. 1989

(NASA-CASE-GSC-13194-1; US-PATENT-5,184,241; US-PATENT-APPL-SN-369171; US-PATENT-CLASS-359-161; US-PATENT-CLASS-367-904; INT-PATENT-CLASS-H04B-10/00) Avail: US Patent and Trademark Office

This patent relates to a laser transmitting and receiving system that includes doppler compensation for large doppler shifts in frequency caused by relative motion between a collocated transceiver and a target or relative motion between separated transmitters and receivers. The system includes a tunable laser, a dithered laser optical frequency standard, and a computer for calculating the estimated Doppler shift at a given time using platform navigation and attitude control inputs as well as inputs relating to pointing data controlling the direction of transmission. The frequency standard and the computer output are employed to develop a Doppler compensation signal which may be used to shift the frequency of the laser transmitter or shift the bandpass of a laser receiver filter. The Doppler compensation is provided by a feedback loop which may include RF components, a timing trigger from the computer, or wavemeters.

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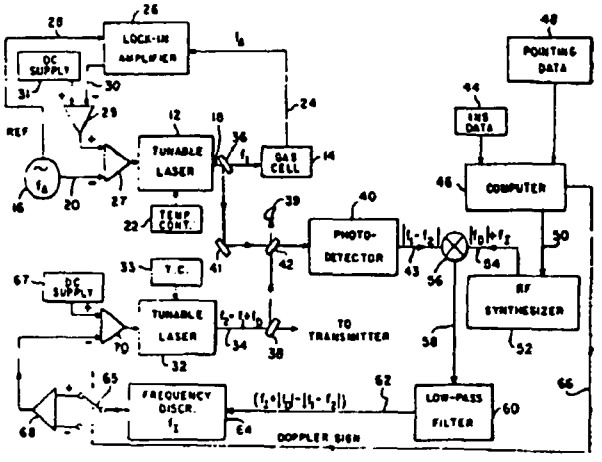


N93-19373*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

METHOD AND APPARATUS FOR DETECTION AND CONTROL OF PRELASING IN A Q-SWITCHED LASER Patent Application

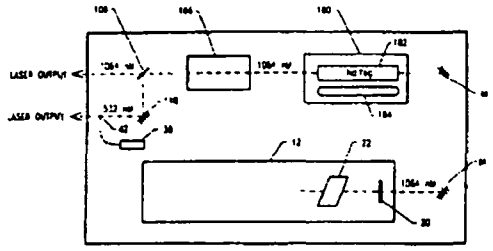
GEORGE E. LOCKARD, inventor (to NASA) 3 Dec. 1992 19 p

(NASA-CASE-LAR-14790-1; NAS 1.71:LAR-14790-1; US-PATENT-APPL-SN-988082) Avail: CASI HC A03/MF A01

The present invention detects prelasing in a Q-switch laser and terminates laser operation upon such detection. A detector senses the presence of light beyond a Q-switch and generates an appropriate electrical signal. A comparison stage circuit compares this detector signal with an established threshold value indicative of prelasing and generates a trigger signal if this detector signal exceeds this threshold value. A control stage circuit receives both this trigger value and a sampled Q-switch signal indicative of an opening of the Q-switch. The control stage circuit terminates operation of the

laser if the trigger signal from the comparison stage is received while the sampled Q-switch signal is being received to avoid the effects of prelasing. Appropriate delays and timing sequencies are established.

NASA



37

MECHANICAL ENGINEERING

Includes auxiliary systems (nonpower); machine elements and processes; and mechanical equipment.

N93-11177*# National Aeronautics and Space Administration. Pasadena Office, CA.

TERMINAL SLIDER CONTROL OF NONLINEAR ROBOTIC SYSTEMS Patent Application

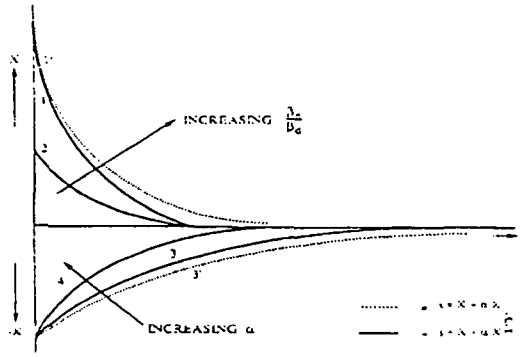
SUBARAMANIAN T. VENKATARAMAN, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) and SANDEEP GULATI, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 18 Jun. 1992 36 p

(Contract NAS7-918)

(NASA-CASE-NPO-18584-1-CU; NAS 1.71:NPO-18584-1-CU; US-PATENT-APPL-SN-921192) Avail: CASI HC A03/MF A01

This invention provides robust nonlinear controllers for robotic operations in unstructured environments based upon a new class of sliding modes denoted terminal sliders that enforce closed loop system convergence to equilibrium in finite time. Improved performance results from the elimination of high frequency control switching previously employed for robustness to parametric uncertainties. Improved performance also results from the dependence of terminal slider stability upon the rate of change of uncertainties over the sliding surface rather than the magnitude of the uncertainty itself for robust control. Terminal sliding mode control also yields improved convergence where convergence time is finite and is to be controlled. This invention also applies terminal sliders to robot manipulator control and benchmark performance with the traditional computed torque control method and provides for design of control parameters.

NASA



N93-12203*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

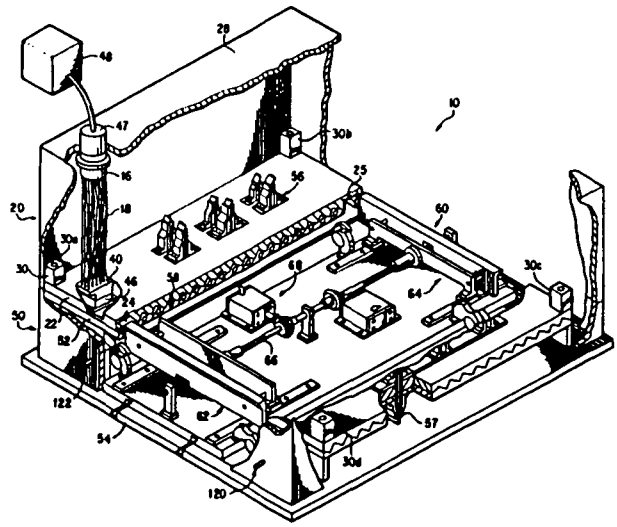
AUTOMATIC SYSTEM FOR INSTALLATION AND REPLACEMENT OF SPACE STATION COMPONENTS Patent Application

ANDREW L. GORDAN, inventor (to NASA) and JAMES L. DOLCE, inventor (to NASA) 28 May 1992 19 p

(NASA-CASE-LEW-14906-1; NAS 1.71:LEW-14906-1; US-PATENT-APPL-SN-889572) Avail: CASI HC A03/MF A01

Service equipment for use in hostile environments is presented. The equipment includes a detachable service unit secured to a stationary service unit. The detachable service unit includes a housing with an exterior plate, a power control interface for connection to an exterior power source, locating pins located in said exterior plate, an electrical connector in the exterior plate electrically coupled to said power control interface, and a pair of clamping receptacles formed in the exterior plate and located on adjacent opposite edges of the exterior plate. The stationary unit includes an electrical connector for connection to the electrical connector of the detachable service unit, a clamping apparatus for clamping and unclamping the detachable service unit from the stationary unit, a base clamp assembly for mounting the clamping apparatus onto the stationary unit, and locating pin holes for receiving the locating pins and aligning the detachable service unit onto the stationary unit. The detachable service unit have mating scalloped faces which aid in alignment and provide a mechanism for heat dissipation.

NASA



N93-12327*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

METHOD AND APPARATUS FOR GRIPPING TEST SPECIMENS Patent Application

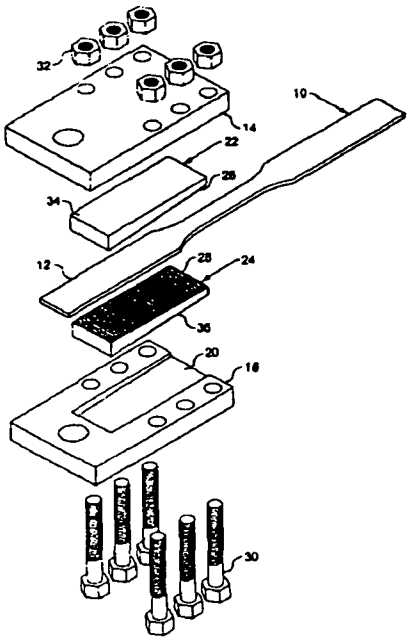
REBECCA A. MACKAY, inventor (to NASA) and MICHAEL V. NATHAL, inventor (to NASA) 18 May 1992 12 p

(NASA-CASE-LEW-15345-1; NAS 1.71:LEW-15345-1; US-PATENT-APPL-SN-884980) Avail: CASI HC A03/MF A01

A pair of solid-teeth wedges are employed in an improved gripping system. The wedges fit inside a pair of plates having an angled cavity to accommodate them. As stress is applied to the specimen, the wedges are urged toward the specimen by the angled

cavity to increase the gripping force. An alignment fixturing device is used to properly position the grips on the test specimen. This device not only axially aligns the grips but also locates them at the proper spacing.

NASA



N93-13417* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

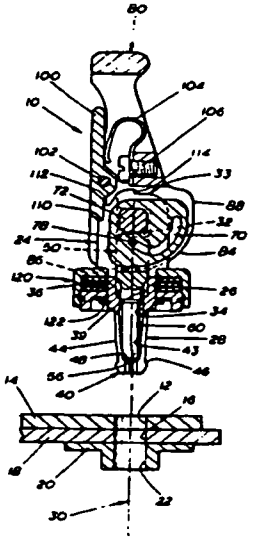
PRELOADED LATCHING DEVICE Patent

CLARENCE J. WESSELSKI, inventor (to NASA) and KORNEL NAGY, inventor (to NASA) 27 Oct. 1992 10 p Filed 25 Feb. 1991 Supersedes N91-23493 (29 - 15, p 2435)

(NASA-CASE-MSC-21730-1; US-PATENT-5,158,331; US-PATENT-APPL-SN-660755; US-PATENT-CLASS-294-94; US-PATENT-CLASS-294-89; INT-PATENT-CLASS-N66L-1/66) Avail: US Patent and Trademark Office

A latching device is disclosed which is lever operated sequentially to actuate a set of collet fingers to provide a radial expansion and to actuate a force mechanism to provide a compressive gripping force for attaching first and second devices to one another. The latching device includes a body member having elongated collet fingers which, in a deactuated condition, is insertable through bores on the first and second devices so that gripping terminal portions on the collet fingers are proximate to the end of the bore of the first device while a spring assembly on the body member is located proximate to the outer surface of a second device. A lever is rotatable through 90 deg to move a latching rod to sequentially actuate and expand collet fingers and to actuate the spring assembly by compressing it. During the first 30 deg of movement of the lever, the collet fingers are actuated by the latching rod to provide a radial expansion and during the last 60 deg of movement of the lever, the spring assembly acts as a force mechanism and is actuated to develop a compressive latching force on the devices. The latching rod and lever are connected by a camming mechanism. The amount of spring force in the spring assembly can be adjusted; the body member can be permanently attached by a telescoping assembly to one of the devices; and the structure can be used as a pulling device for removing annular bearings or the like from blind bores.

Official Gazette of the U.S. Patent and Trademark Office



N93-13423* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

FASTENING APPARATUS HAVING SHAPE MEMORY ALLOY ACTUATOR Patent

DARIN N. MCKINNIS, inventor (to NASA) 3 Nov. 1992 9 p Filed 13 May 1992 Supersedes N92-29762 (30 - 20, p 3479)

(NASA-CASE-MSC-21935-1; US-PATENT-5,160,233; US-PATENT-APPL-SN-882408; US-PATENT-CLASS-411-433; US-PATENT-CLASS-411-267; US-PATENT-CLASS-411-909; INT-PATENT-CLASS-F16B-37/08; INT-PATENT-CLASS-F16B-39/36) Avail: US Patent and Trademark Office

A releasable fastening apparatus is presented. The device includes a connecting member and a housing. The housing supports a gripping mechanism that is adapted to engage the connecting member. A triggering member is movable within the housing between a first position in which it constrains the gripping mechanism in locked engagement with the connecting member, and a second position in which the gripping mechanism is disengaged from the connecting member. A shaped memory alloy actuator is employed for translating the triggering member from its first to its second position. The actuator is designed to expand longitudinally when transitioned from a martensitic to an austenitic state.

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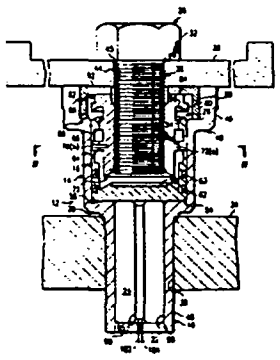


N93-14702* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

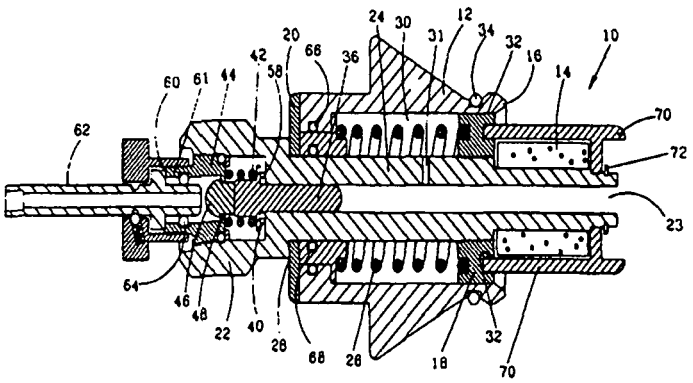
THRUSTER SEALING SYSTEM AND APPARATUS Patent

PAUL A. SVEJKOVSKY, inventor (to NASA) 24 Nov. 1992 10 p Filed 22 Oct. 1991 Supersedes N92-17872 (30 - 8, p 1307)

(NASA-CASE-MSC-21898-1; US-PATENT-5,165,229; US-PATENT-APPL-SN-780512; US-PATENT-CLASS-60-271; US-PATENT-CLASS-60-223; US-PATENT-CLASS-60-259; US-PATENT-CLASS-60-39.091; INT-PATENT-CLASS-F02K-9/96; INT-PATENT-CLASS-B65D-39/12) Avail: US Patent and Trademark Office

A thruster nozzle sealing system and apparatus is provided for protection of spacecraft thruster motors. The system includes a sealing plug, a sealing plug insertion tool, an outer cover, an outer cover attachment, and a ferry flight attachment. The sealing plug prevents moisture from entering the thruster engine so as to prevent valve failure. The attachments are interchangeably connectable with the sealing plug. The ferry flight attachment is used during air transportation of the spacecraft, and the outer cover attachment is used during storage and service of the spacecraft. The outer cover provides protection to the thruster nozzle from mechanical damage.

Official Gazette of the U.S. Patent and Trademark Office



N93-14710* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

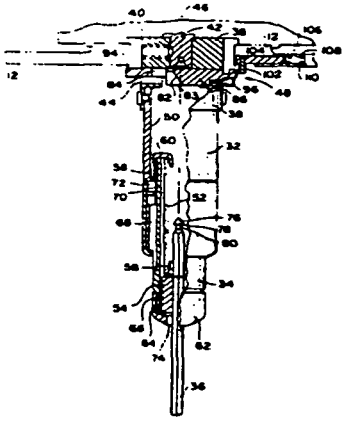
RETRACTABLE TOOL BIT HAVING SLIDER TYPE CATCH MECHANISM Patent

GEORGE M. VOELLMER, inventor (to NASA) 29 Dec. 1992 8 p Filed 24 Sep. 1991 Supersedes N92-24058 (29 - 14, p 2385)

(NASA-CASE-GSC-13358-1; US-PATENT-5,174,694; US-PATENT-APPL-SN-765069; US-PATENT-CLASS-408-124; US-PATENT-CLASS-279-79; US-PATENT-CLASS-279-89; US-PATENT-CLASS-408-239R; US-PATENT-CLASS-408-241R; US-PATENT-CLASS-901-41; INT-PATENT-CLASS-B23B-31/10) Avail: US Patent and Trademark Office

A retractable tool bit assembly utilized in connection with a robotic gripper type end-effector is presented. The apparatus includes one or more spring loaded nestable or telescoping tubular sections together with a catch mechanism for capturing and holding the toll, such as an allen key, in its retracted position. The innermost tubular section includes a threshold cap and engages and holds the tool. The catch mechanism consists of a slider type mechanism located adjacent a relatively larger outer base section and includes means for engaging a conically or mushroom shaped rear end portion of the tool when the telescoping sections are moved to a retracted or parked position. The catch mechanism is released upon actuation of a rotary tool drive motor coupled to a circular mount and which holds the base section. When released all the telescoping sections including the tool extends fully outward to a use position.

Official Gazette of the U.S. Patent and Trademark Office



N93-14712* National Aeronautics and Space Administration, Washington, DC.

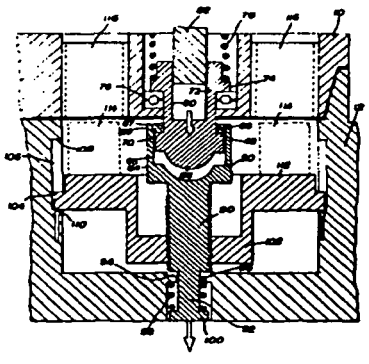
WORK ATTACHMENT MECHANISM/WORK ATTACHMENT FIXTURE Patent

JOHN M. VRANISH, inventor (to NASA) 29 Dec. 1992 10 p Filed 22 Jan. 1992

(NASA-CASE-GSC-13430-1; US-PATENT-5,174,772; US-PATENT-APPL-SN-824126; US-PATENT-CLASS-439-131; US-PATENT-CLASS-439-139; US-PATENT-CLASS-439-310; INT-PATENT-CLASS-H01R-13/54) Avail: US Patent and Trademark Office

A mechanical coupling system is described wherein a spline screw system is used to connect two bodies, a work attachment mechanism and a work attachment fixture. A kinematic clamp first guides and mates the attachment mechanism to the attachment fixture. The kinematic clamp includes three round roller members equidistantly located around the periphery of the bodies and three correspondingly located V-shaped grooves located on the periphery of the other body. A motor driven spline screw in the attachment mechanism then engages a spline bolt head in the attachment fixture and includes a threaded shank upon which is mounted a translatable nut which is adapted to translate up and down the shank but not rotate. The nut carries one or more electrical connectors which travel upwardly during a connecting sequence and cams open a set of dust covers which operate to engage an opposing set of dust covers adjacent complementary type electrical connectors on the attachment mechanism. A mechanical and electrical interconnection process between the bodies occurs sequentially.

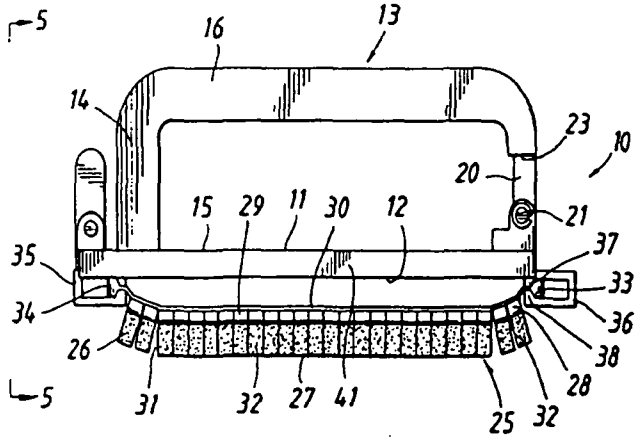
Official Gazette of the U.S. Patent and Trademark Office



N93-14842*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.
EXTRA-VEHICULAR ACTIVITY TRANSLATION TOOL Patent Application
LESLIE S. HARTZ, inventor (to NASA) 21 Aug. 1992 20 p (NASA-CASE-MSC-21955-1; US-PATENT-APPL-SN-931468) Avail: CASI HC A03/MF A01

A portable hand-grip device for use during extravehicular activity is described. The device has a base member overlaid by a flexible pad having its opposite end releasably secured to the base. The pad includes an adhesive-covered surface which may be attached to a flat surface. A plurality of closely-spaced elongated rigid members are arranged side-by-side across the back of the flexible sheet to reinforce the flexible pad. The ends of these reinforcing members project beyond the opposite sides of the base and flexible pad. A selectively-operable mechanism on the base member releasably captures the outer end of the reinforcing members and secures them when the pad member is attached to a flat surface and provides a load path between a handle on the base and the flexible pad. The selectively-operable mechanism is further arranged to selectively release the reinforcing members so that the device may be progressively peeled away from a wall surface.

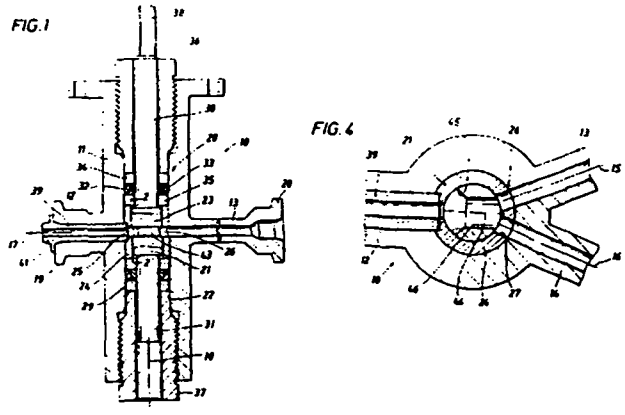
NASA



N93-14843*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.
HIGH-TEMPERATURE, HIGH-PRESSURE OXYGEN METERING VALVE Patent Application
ROLLIN C. CHRISTIANSON, inventor (to NASA), PETER P. LYCOU, inventor (to NASA), and JAMES A. DANIEL, inventor (to NASA) 14 Aug. 1992 21 p
(NASA-CASE-MSC-21823-1; US-PATENT-APPL-SN-929552) Avail: CASI HC A03/MF A01

A control valve includes a body defining a central cavity arranged between a fluid inlet and outwardly-diverging first and second fluid outlets respectively disposed in a common transverse plane. A valve member is arranged in the cavity for rotation between first and second operating positions where a transverse fluid passage through the valve member alternatively communicates the fluid inlet with one or the other of the fluid outlets. To minimize fluid turbulence when the valve member is rotated to an alternate operating position, the fluid passage has a convergent entrance for maintaining the passage in permanent communication with the fluid inlet as well as an oblong exit opening with spaced side walls for enabling the exit opening to temporarily span the first and second fluid outlets as the valve member is turned between its respective operating positions.

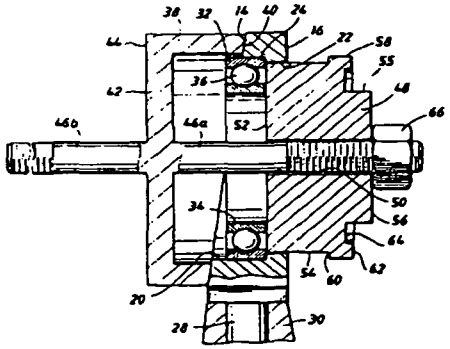
NASA



N93-14871* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.
BEARING SERVICING TOOL Patent
REX A. BOYCE, inventor (to NASA) 24 Nov. 1992 8 p Filed 31 Oct. 1991
(NASA-CASE-MSC-21881-1; US-PATENT-5,165,169; US-PATENT-APPL-SN-785637; US-PATENT-CLASS-29-898.08; US-PATENT-CLASS-29-898.01; US-PATENT-CLASS-29-898.07; US-PATENT-CLASS-29-426.5; US-PATENT-CLASS-29-263; INT-PATENT-CLASS-B23P-19/00) Avail: US Patent and Trademark Office

A tool for removing and/or replacing bearings in situ is presented. The tool is comprised of a brace having a first end adapted to engage a first end of the bearing housing, and a second end adapted to engage a second end of the bearing housing. If the two ends of the bearing housing are different in configuration, then the respective ends of the brace are configured accordingly. An elongate guide member integral with the brace has two parts, each projecting endwise from a respective end of the brace. A removable pressure plate can be mounted on either part of the guide member for longitudinal movement therealong and has first and second ends of different configurations adapted to engage the first and second ends of the bearing. A threaded-type drive is cooperative between the guide and the pressure plate to move the pressure plate longitudinally along the guide and apply a force to the bearing, either to remove the bearing from its housing, or to emplace a new bearing in the housing.

Official Gazette of the U.S. Patent and Trademark Office



N93-17057*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

SADDLE CLAMP ASSEMBLY Patent Application

CHARLES R. BELROSE, inventor (to NASA) 17 Nov. 1992 14 p (NASA-CASE-MFS-28701-1; NAS 1.71:MFS-28701-1; US-PATENT-APPL-SN-977468) Avail: CASI HC A03/MF A01

A saddle clamp assembly is presented. The assembly is comprised of a hollow cylindrical body centered about a longitudinal axis and being diametrically split into semicircular top and bottom sections. Each section has a pair of connection flanges, at opposite ends, that project radially outward. A pair of bolts are retained on the top section flanges and are threadable into nuts retained on the bottom section flanges. A base member is anchored to a central underside portion of the bottom clamp body section and has a pair of connection tabs positioned beneath the bottom clamp body section connection flanges on opposite sides of the clamp axis. A pair of bolts are retained on the base member connection tabs and are threadable into a pair of nuts retainable on a support structure. The connection tab and connection flanges on each side of the clamp body are axially offset in a manner permitting downward installation/removable tool access to the lower bolts past the connection flanges. An elongated retention tether is used to connect the top clamp body section to the balance of the clamp assembly. This prevents loss of the top clamp body section when it is removed from the bottom clamp body section.

NASA

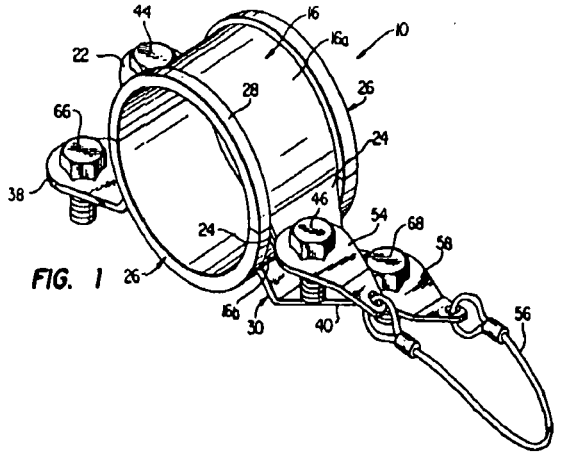


FIG. 1

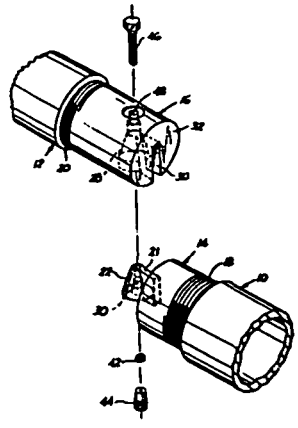
N93-17080*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

SLIP JOINT CONNECTOR Patent Application

FRANK P. THOMAS, inventor (to NASA) 28 Aug. 1992 12 p (NASA-CASE-MFS-28659-1; NAS 1.71:MFS-28659-1; US-PATENT-APPL-SN-936474) Avail: CASI HC A03/MF A01

A slip joint connector for joining first and second structural elements together is presented. The connector has a first body member attachable to the first structural element and a second body member attachable to the second structural element. The first body member has a male protuberance including a conical portion and the second body member has a conical receptacle for cooperatively receiving the conical portion of the protuberance. The protuberance includes a bridging portion for spacing the conical portion from the remainder of the first body member and the second body member has a well communicating with the conical receptacle for receiving the bridging portion. The conical male portion internally carries a nut while the second body member may receive a bolt through the receptacle to be threadedly received by the nut to secure the first and second body members tightly together.

NASA



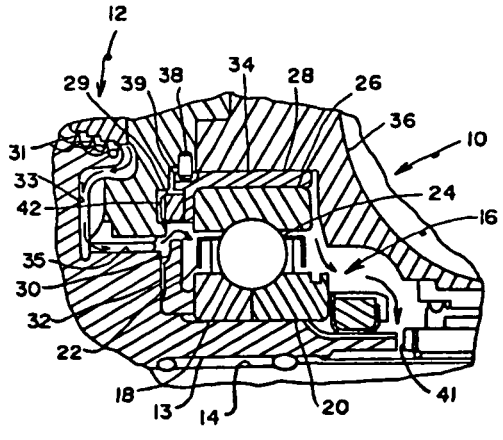
N93-17084*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

RADIAL SPLINE ASSEMBLY FOR ANTIFRICTION BEARINGS Patent Application

JERRY H. MOORE, inventor (to NASA) 7 Oct. 1992 14 p (NASA-CASE-MFS-28629-1; NAS 1.71:MFS-28629-1; US-PATENT-APPL-SN-957128) Avail: CASI HC A03/MF A01

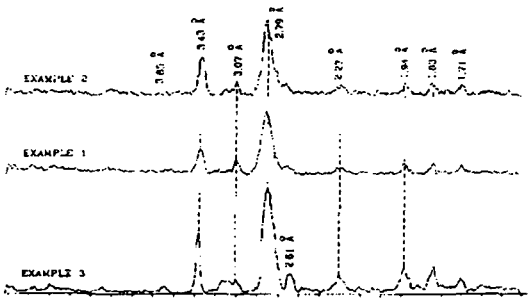
An outer race carrier is constructed for receiving an outer race of an antifriction bearing assembly. The carrier in turn is slidably fitted in an opening of a support wall to accommodate slight axial movements of a shaft. A plurality of longitudinal splines on the carrier are disposed to be fitted into matching slots in the opening. A deadband gap is provided between sides of the splines and slots, with a radial gap at ends of the splines and slots and a gap between the splines and slots sized larger than the deadband gap. With this construction, operational distortions (slope) of the support wall are accommodated by the larger radial gaps while the deadband gaps maintain a relatively high springrate of the housing. Additionally, side loads applied to the shaft are distributed between sides of the splines and slots, distributing such loads over a larger surface area than a race carrier of the prior art.

NASA



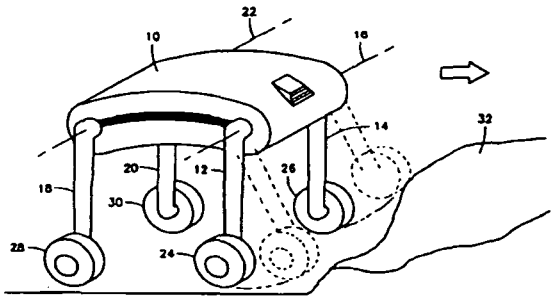
N93-17271*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.
SLOW-RELEASE FERTILIZER Patent Application
DOUGLAS W. MING, inventor (to NASA) and D. C. GOLDEN, inventor (to NASA) 16 Oct. 1992 19 p
(NASA-CASE-MSC-21953-1-NP; NAS 1.71:MSC-21953-1-NP; US-PATENT-APPL-SN-963348) Avail: CASI HC A03/MF A01

A synthetic apatite containing agronutrients and a method for making the apatite are disclosed. The apatite comprises crystalline calcium phosphate having agronutrients dispersed in the crystalline structure. The agronutrients can comprise potassium, magnesium, sulfur, iron, manganese, molybdenum, chlorine, boron, copper and zinc in amounts suited for plant growth. The apatite can optionally comprise a carbonate and/or silicon solubility control agent. The agronutrients are released slowly as the apatite dissolves.
NASA



N93-17272*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
A METHOD FOR SURMOUNTING AN OBSTACLE BY A ROBOT VEHICLE Patent Application
BRIAN H. WILCOX, inventor (to NASA) and TIMOTHY R. OHM, inventor (to NASA) 1 Oct. 1992 10 p
(NASA-CASE-NPO-18764-1-CU; NAS 1.71:NPO-18764-1-CU; US-PATENT-APPL-SN-956684) Avail: CASI HC A02/MF A01

Surmounting obstacles in the path of a robot vehicle is accomplished by rotating the wheel forks of the vehicle about their transverse axes with respect to the vehicle body so as to shift most of the vehicle weight onto the rear wheels, and then driving the vehicle forward so as to drive the now lightly-loaded front wheels (only) over the obstacle. Then, after the front wheels have either surmounted or completely passed the obstacle (depending upon the length of the obstacle), the forks are again rotated about their transverse axes so as to shift most of the vehicle weight onto the front wheels. Then the vehicle is again driven forward so as to drive the now lightly-loaded rear wheels over the obstacle. Once the obstacle has been completely cleared and the vehicle is again on relatively level terrain, the forks are again rotated so as to uniformly distribute the vehicle weight between the front and rear wheels.
NASA



N93-17625* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
DOUBLE-V BLOCK FINGERS WITH CRUCIFORM RECESS Patent
GEORGE M. VOELLMER 12 Jan. 1993 7 p Filed 17 Jun. 1992 Continuation of abandoned US-Patent-Appl-SN-760634, filed 16 Sep. 1991
(NASA-CASE-GSC-13356-2; US-PATENT-5,178,431; US-PATENT-APPL-SN-899145; US-PATENT-CLASS-294-86.4; US-PATENT-CLASS-294-902; US-PATENT-CLASS-901-39; US-PATENT-CLASS-269-270; INT-PATENT-CLASS-B25J-15/08) Avail: US Patent and Trademark Office

In a robot having a gripper including a pair of fingers and a drive motor for driving the fingers toward and away from one another while the fingers remain parallel to each other, the fingers consist of finger pads, which interface with a handle on an object to be grasped, and a shank, which attaches the fingers to the robot gripper. The double-V finger has two orthogonal V-grooves forming in the center of the finger pads and recessed cruciform. The double-V finger is used with a handle on the object to be grasped which is the negative of the finger pads. The handle face consists of V-shaped pads capped with a rectangular cruciform. As the gripper is brought into place near the handle, the finger pads are lined up facing the handle pads. When the finger pad and the handle pad are in proper alignment, the rectangular ridges on the handle fall inside the rectangular grooves on the finger, and the grip is complete.
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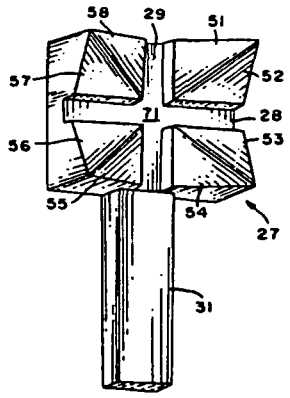

N93-18286* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
RETRACTABLE TOOL BIT HAVING LATCH TYPE CATCH MECHANISM Patent
GEORGE VOELLMER, inventor (to NASA) 19 Jan. 1993 7 p Filed 22 Nov. 1991 Supersedes N92-23378 (30 - 14, p 2381)
(NASA-CASE-GSC-13359-1; US-PATENT-5,180,259; US-PATENT-APPL-SN-796496; US-PATENT-CLASS-408-124; US-PATENT-CLASS-279-23.1; US-PATENT-CLASS-279-79; US-PATENT-CLASS-408-239R; US-PATENT-CLASS-408-241R; US-PATENT-CLASS-901-41; INT-PATENT-CLASS-B23B-31/10) Avail: US Patent and Trademark Office

A retractable tool bit assembly for a tool such as an allen key is presented. The assembly includes one or more spring loaded nestable or telescoping tubular sections together with a catch mechanism for capturing and holding the tool in its retracted position. The catch mechanism consists of a latch mechanism located in a base section and which engages a conically shaped tool head located at the inner end of the tool. The tool head adjoins an eccentric oval type neck portion which extends to a rear lip of the tool head.The latch mechanism releases when the ovular neck portion rotates about the catch members upon actuation of a rotary tool drive motor. When released, all the telescoping sections and the tool extends fully

outward to a use position.ovular neck portion rotates about the catch members upon actuation of a rotary tool drive motor. When released, all the telescoping sections and the tool extends fully outward to a use position.

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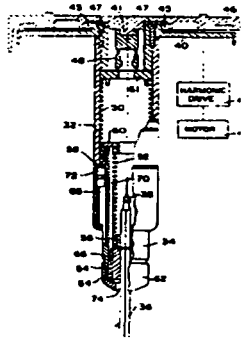

N93-18288* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

SPLIT RAIL GRIPPER ASSEMBLY AND TOOL DRIVER THEREFOR Patent

GEORGE M. VOELLMER, inventor (to NASA) 9 Feb. 1993 10 p Filed 2 Sep. 1992 Continuation-in-part of US-Patent-Appl-SN-656924, filed 15 Feb. 1991

(NASA-CASE-GSC-13370-2; US-PATENT-5,184,861; US-PATENT-APPL-SN-938577; US-PATENT-APPL-SN-656924; US-PATENT-CLASS-294-119.1; US-PATENT-CLASS-901-41; US-PATENT-CLASS-294-907; INT-PATENT-CLASS-B25J-15/08) Avail: US Patent and Trademark Office

This patent relates to a split rail gripper for a robotic apparatus including a pair of rails which are driven in mutually opposite directions by a rack and pinion gear mechanism. Each rail includes a set of rack gear teeth which engage respective pinion gears and where the top rail engaging one of the pinion gears is driven by a harmonic gear reduction drive and motor unit coupled to a drive screw. The other pinion gear is driven by the top pinion gear engaging a set of rack gear teeth included in the bottom rail. As the top rail is driven in or out, the upper pinion gear is rotated, causing the other pinion gear, in turn, to rotate in the opposite direction. This causes the bottom rail to move in an opposite linear direction relative to the top rail. An outwardly extending gripper finger assembly is attached to respective ends of the rails, with each gripper finger including an arrangement of vertically and horizontally mounted roller members which operate to automatically center and engage an H-plate type interface secured to the object being grasped. The gripper assembly also includes a base plate attached to an interface plate of a robotic tool changer mechanism. A retractable rotary tool driver and tool is also centrally mounted on the base plate.

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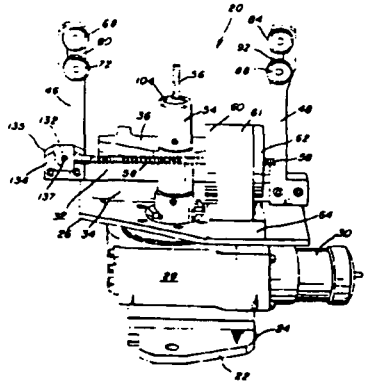


N93-19027*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

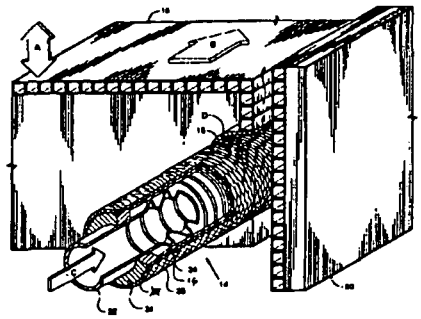
HIGH-TEMPERATURE, BELLOWS HYBRID SEAL Patent Application

B. M. STEINETZ, inventor (to NASA) and P. J. SIROCKY, inventor (to NASA) (Sverdrup Technology, Inc., Brook Park, OH.) 22 Jan. 1993 15 p

(NASA-CASE-LEW-15570-1; NAS 1.71:LEW-15570-1; US-PATENT-APPL-SN-007874) Avail: CASI HC A03/MF A01

A high-temperature hybrid seal is constructed of multiple elements to meet the many demands placed on the seal. The primary elements are: a central high-temperature bellows, a braided ceramic sheath covering the bellows, an outer abrasion resistant sheath covering the ceramic sheath, and a structurally-sound seal-end termination.

NASA



N93-19049*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

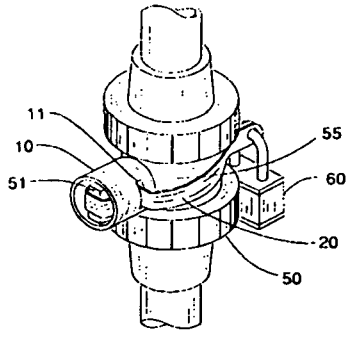
VALVE LOCK Patent Application

RICHARD K. BURLEY, inventor (to NASA) (Rockwell International Corp., Huntsville, AL.) and KAMAL S. GUIRGUIS, inventor (to NASA) (Rockwell International Corp., Huntsville, AL.) 17 Nov.1992 11 p

(NASA-CASE-MFS-29764-1; NAS 1.71:MFS-29764-1; US-PATENT-APPL-SN-977469) Avail: CASI HC A03/MF A01

A valve security lock is provided which secures a double union ball valve. The lock is formed from a band inserted through slits in a tube, with that combination being positioned over the valve stem to be secured, and the ends of the band wrapped around the circumference of the double union ball valve. The apparatus is secured around the double union ball valve by insertion of the shank of a lock of known kind through holes in the ends of the band. In a fluid control system, the valve security lock provides a highly visible means to prevent accidental turn-ons or turn-offs during system maintenance, but which can be easily disengaged by persons having the key or combination to the shank type lock.

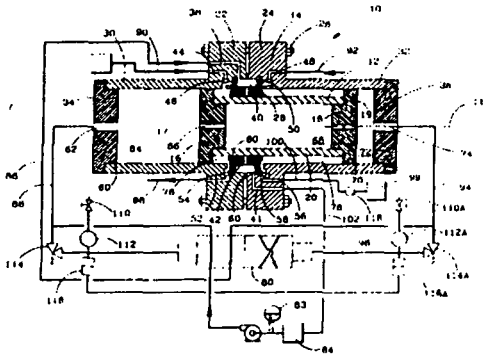
NASA



N93-19331*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.
COOLED SPOOL PISTON COMPRESSOR Patent Application
B. G. MORRIS, inventor (to NASA) 29 Dec. 1992 20 p
(NASA-CASE-MSC-22020-1; NAS 1.71:MSC-22020-1; US-PATENT-APPL-SN-998062) Avail: CASI HC A03/MF A01

A hydraulically powered gas compressor receives low pressure gas and outputs a high pressure gas. The housing of the compressor defines a cylinder with a center chamber having a cross-sectional area less than the cross-sectional area of a left end chamber and a right end chamber, and a spool-type piston assembly is movable within the cylinder and includes a left end closure, a right end closure, and a center body that are in sealing engagement with the respective cylinder walls as the piston reciprocates. First and second annual compression chambers are provided between the piston enclosures and center housing portion of the compressor, thereby minimizing the spacing between the core gas and a cooled surface of the compressor. Restricted flow passageways are provided in the piston closure members and a path is provided in the central body of the piston assembly, such that hydraulic fluid flows through the piston assembly to cool the piston assembly during its operation. The compressor of the present invention may be easily adapted for a particular application, and is capable of generating high gas pressures while maintaining both the compressed gas and the compressor components within acceptable temperature limits.

NASA



38

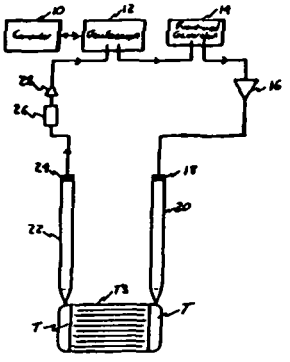
QUALITY ASSURANCE AND RELIABILITY

Includes product sampling procedures and techniques; and quality control.

N93-12204*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
METHOD AND APPARATUS FOR EVALUATING MULTILAYER OBJECTS FOR IMPERFECTIONS Patent Application
JOSEPH S. HEYMAN, inventor (to NASA) and M. N. ABEDIN, inventor (to NASA) (AS&M, Inc., Hampton, VA.) 15 Apr. 1992 15 p
(NASA-CASE-LAR-14581-1-SB; NAS 1.71:LAR-14581-1-SB; US-PATENT-APPL-SN-873407) Avail: CASI HC A03/MF A01

A multilayer object where the layers are arranged in a stacking direction is evaluated for imperfections such as voids, delaminations, and microcracks. First, an acoustic wave is transmitted into the object in the stacking direction via an appropriate transducer/waveguide combination. The wave propagates through the multilayer object and is received by another transducer/waveguide combination preferably located on the same surface as the transmitting combination. The received acoustic wave is correlated with the presence or absence of imperfections by generating pulse echo signals indicative of the received acoustic wave, wherein the successive signals form distinct groups over time. The respective peak amplitudes of each group are sampled and fitted to an exponential curve, wherein a substantial fit of approximately 80-90 percent indicates the absence of imperfections. Alternatively, the time interval between distinct groups can be measured, wherein equal intervals indicate the absence of imperfections and unequal intervals indicate the presence of imperfections.

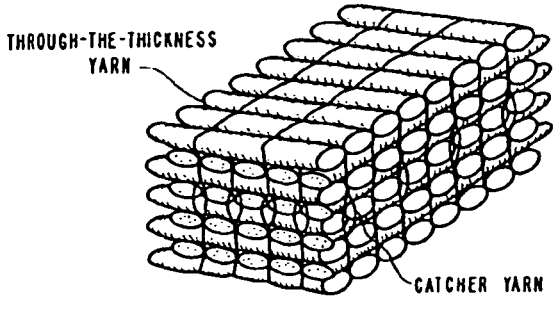
NASA



N93-17048*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
RAPID DETECTION AND QUANTIFICATION OF FEATURES SUCH AS DAMAGE OR FLAWS IN COMPOSITE AND METALLIC STRUCTURES Patent Application
GARY L. FARLEY, inventor (to NASA), BARRY T. SMITH, inventor (to NASA), JOSEPH N. ZALAMEDA, inventor (to NASA), and WILLIAM P. WINFREE, inventor (to NASA) 29 Oct. 1992 27 p
(NASA-CASE-LAR-14850-1-CU; NAS 1.71:LAR-14850-1-CU; US-PATENT-APPL-SN-969869) Avail: CASI HC A03/MF A01

An apparatus, system, and method for non-destructible evaluation (NDE) of a material use thermography to rapidly detect and/or generally locate a feature such as, for example, damage or a defect in the material. The apparatus, system, and method also use ultrasound to specifically locate the feature in the material for quantification and/or evaluation either by an operator or by an external device suited for such purpose. Accordingly, the apparatus, system and method are particularly useful for NDE in applications such as the analysis of the structure of an aircraft, for example, in which the scale of the material to be analyzed is large, thus requiring the rapid NDE afforded by thermography, and in which quantification and/or evaluation of a feature must be performed with precision, thus requiring the relatively high-resolution NDE afforded by ultrasound.

NASA



39

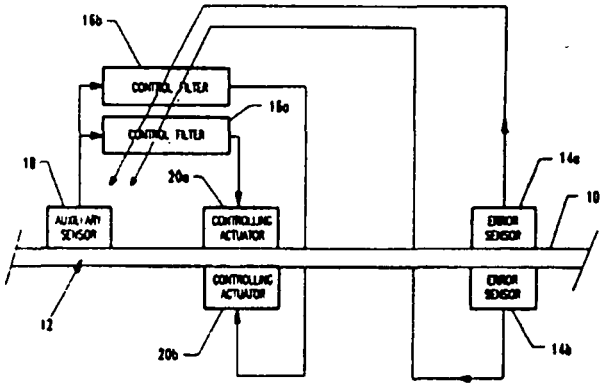
STRUCTURAL MECHANICS

Includes structural element design and weight analysis; fatigue; and thermal stress.

N93-13420* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
METHOD AND APPARATUS FOR MINIMIZING MULTIPLE DEGREE OF FREEDOM VIBRATION TRANSMISSION BETWEEN TWO REGIONS OF A STRUCTURE Patent
RICHARD J. SILCOX, inventor (to NASA), CHRIS R. FULLER, inventor (to NASA), and GARY P. GIBBS, inventor (to NASA) 20 Oct. 1992 13 p Filed 4 Mar. 1991 Supersedes N92-10202 (30 - 1, p 39) (NASA-CASE-LAR-14508-1-CU; US-PATENT-5,156,370; US-PATENT-APPL-SN-664194; US-PATENT-CLASS-248-550; US-PATENT-CLASS-73-579; US-PATENT-CLASS-73-668; US-PATENT-CLASS-318-649; US-PATENT-CLASS-318-648; INT-PATENT-CLASS-G05D-15/01; INT-PATENT-CLASS-G05D-19/01) Avail: US Patent and Trademark Office

Arrays of actuators are affixed to structural elements to impede the transmission of vibrational energy. A single pair is used to provide control of bending and extensional waves and two pairs are used to control torsional motion. The arrays are applied to a wide variety of structural elements such as a beam structure that is part of a larger framework that may or may not support a rigid or non-rigid skin. Electrical excitation is applied to the actuators that generate forces on the structure. These electrical inputs may be adjusted in their amplitude and phase by a controller in communication with appropriate vibrational wave sensors to impede the flow of vibrational power in all of the above mentioned wave forms beyond the actuator location. Additional sensor elements can be used to monitor the performance and adjust the electrical inputs to maximize the attenuation of vibrational energy.

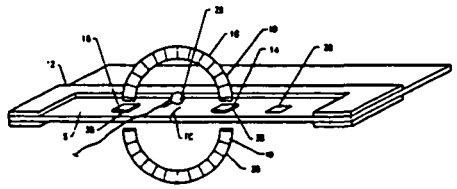
Official Gazette of the U.S. Patent and Trademark Office



N93-19329*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
HIGH SPEED THIN PLATE FATIGUE CRACK MONITOR Patent Application
BUZZ A. WINCHESKI, inventor (to NASA) (Analytical Services and Materials, Inc., Hampton, VA.), JOSEPH S. HEYMAN, inventor (to NASA), MIN NAMKUNG, inventor (to NASA), and JAMES P. FULTON, inventor (to NASA) (Analytical Services and Materials, Inc., Hampton, VA.) 8 Dec. 1992 36 p
(NASA-CASE-LAR-14816-1-SB; NAS 1.71:LAR-14816-1-SB; US-PATENT-APPL-SN-988084) Avail: CASI HC A03/MF A01

A device and method are provided which non-destructively detect crack length and crack geometry in thin metallic plates. A non-contacting vibration apparatus produces resonant vibrations without introducing extraneous noise. Resulting resonant vibration shifts in cracked plates are correlated to known crack length in plates with similar resonant vibration shifts. In addition, acoustic emissions of cracks at resonance frequencies are correlated to acoustic emissions from known crack geometries.

NASA



47

METEOROLOGY AND CLIMATOLOGY

Includes weather forecasting and modification.

N93-10108* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
METHOD AND APPARATUS FOR DETERMINING RETURN STROKE POLARITY OF DISTANT LIGHTNING Patent
RICHARD J. BLAKESLEE, inventor (to NASA) and MARX BROOK, inventor (to NASA) 6 Oct. 1992 6 p Filed 15 Oct. 1991 Continuation of abandoned US-Patent-7,571,687, issued 23 Aug. 1990
(NASA-CASE-MFS-26102-2-CU; US-PATENT-5,153,508; US-PATENT-7,571,687; US-PATENT-APPL-SN-776710; US-PATENT-CLASS-324-72; US-PATENT-CLASS-340-601; INT-PATENT-CLASS-G01W-1/00; INT-PATENT-CLASS-G01R-31/02) Avail: US Patent and Trademark Office

A method is described for determining the return stroke polarity of distant lightning for distances beyond 600 km by detecting the electric field associated with a return stroke of distant lightning, and processing the electric field signal to determine the polarity of the slow tail of the VLF waveform signal associated with the detected electric field. The polarity of the return stroke of distant lightning is determined based upon the polarity of the slow tail portion of the waveform.

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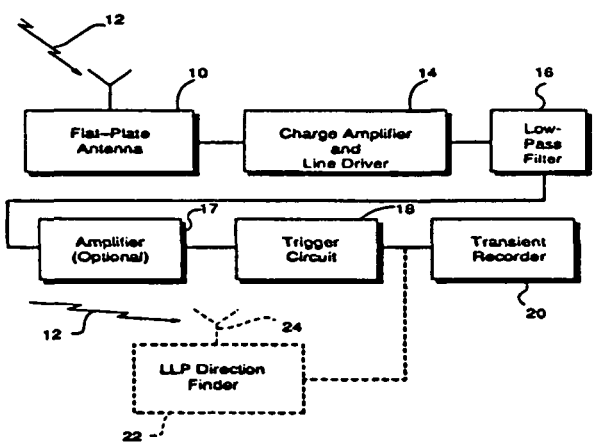


51

LIFE SCIENCES (GENERAL)

N93-10109* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

METHOD FOR CULTURING MAMMALIAN CELLS IN A PERFUSED BIOREACTOR Patent

RAY P. SCHWARZ, inventor (to NASA) and DAVID A. WOLF, inventor (to NASA) 13 Oct. 1992 10 p Filed 28 Jun. 1990 Division of US-Patent-Appl-SN-213559, filed 30 Jun. 1988

(NASA-CASE-MSC-21293-2; US-PATENT-5,155,035; US-PATENT-APPL-SN-545233; US-PATENT-APPL-SN-213559; US-PATENT-CLASS-435-240.24; US-PATENT-CLASS-435-240.25; US-PATENT-CLASS-435-240.46; INT-PATENT-CLASS-C12N-5/02) Avail: US Patent and Trademark Office

A bio-reactor system wherein a tubular housing contains an internal circularly disposed set of blade members and a central tubular filter all mounted for rotation about a common horizontal axis and each having independent rotational support and rotational drive mechanisms. The housing, blade members and filter preferably are driven at a constant slow speed for placing a fluid culture medium with discrete microbeads and cell cultures in a discrete spatial suspension in the housing. Replacement fluid medium is symmetrically input and fluid medium is symmetrically output from the housing where the input and the output are part of a loop providing a constant or intermittent flow of fluid medium in a closed loop.

Official Gazette of the U.S. Patent and Trademark Office

N93-10110* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

METHOD FOR CULTURING MAMMALIAN CELLS IN A HORIZONTALLY ROTATED BIOREACTOR Patent

RAY P. SCHWARZ, inventor (to NASA), DAVID A. WOLF, inventor (to NASA), and TINH T. TRINH, inventor (to NASA) 6 Oct. 1992 7 p Filed 15 Apr. 1991 Division of US-Patent-Appl-SN-213558, filed 30 Jun. 1988

(NASA-CASE-MSC-21294-2; US-PATENT-5,153,133; US-PATENT-APPL-SN-687605; US-PATENT-APPL-SN-213558; US-PATENT-CLASS-435-240.24; US-PATENT-CLASS-435-240.25; US-PATENT-CLASS-435-240.46; US-PATENT-CLASS-435-240.241; US-PATENT-CLASS-435-818; INT-PATENT-CLASS-C12N-5/02) Avail: US Patent and Trademark Office

A bio-reactor system where cell growth microcarrier beads are suspended in a zero head space fluid medium by rotation about a horizontal axis and where the fluid is continuously oxygenated from a tubular membrane which rotates on a shaft together with rotation of the culture vessel. The oxygen is continuously throughput through the membrane and disbursed into the fluid medium along the length of the membrane.

Official Gazette of the U.S. Patent and Trademark Office

N93-17049*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

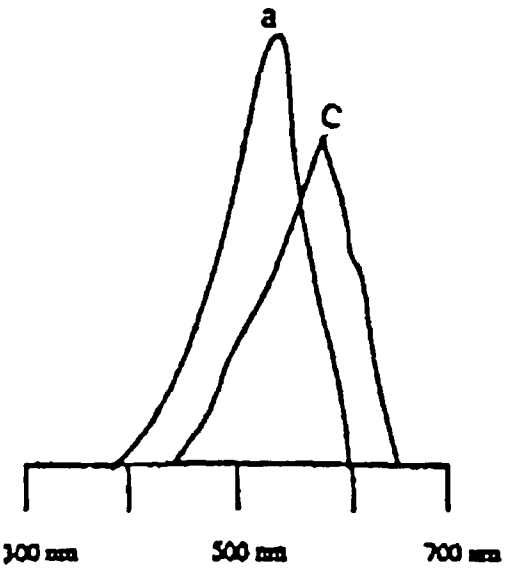
KINETIC TETRAZOLIUM MICROTITER ASSAY Patent Application

DUANE L. PIERSON, inventor (to NASA), RAYMOND P. STOWE, inventor (to NASA), and DAVID W. KOEING, inventor (to NASA) 31 Jul. 1992 29 p

(NASA-CASE-MSC-21979-1; NAS 1.71:MSC-21979-1; US-PATENT-APPL-SN-931942) Avail: CASI HC A03/MF A01

A method for conducting an in vitro cell assay using a tetrazolium indicator is disclosed. The indicator includes a nonionic detergent which solubilizes a tetrazolium reduction product in vitro and has low toxicity for the cells. The incubation of test cells in the presence of zolium bromide and octoxynol (TRITON X-100) permits kinetics of the cell metabolism to be determined.

NASA



N93-18351* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

REGENERABLE BIOCIDE DELIVERY UNIT Patent

RICHARD L. SAUER, inventor (to NASA) (Umpqua Research Co., Myrtle Creek, OR.), GERALD V. COLOMBO, inventor (to NASA), and CLIFFORD D. JOLLY, inventor (to NASA) (Umpqua Research Co., Myrtle Creek, OR.) 5 Jan. 1993 7 p Filed 18 Mar. 1991 Supersedes N91-25570 (29 - 17, p 2817)

(NASA-CASE-MSC-21763-1-SB; US-PATENT-5,176,836; US-PATENT-APPL-SN-671603; US-PATENT-CLASS-210-670; US-PATENT-CLASS-210-739; US-PATENT-CLASS-210-753; US-PATENT-CLASS-210-764; US-PATENT-CLASS-210-96.1; US-PATENT-CLASS-210-140; US-PATENT-CLASS-210-190) Avail: US Patent and Trademark Office

A method and apparatus are disclosed for maintaining continuous, long-term microbial control in the water supply for potable, hygiene, and experimental water for space activities, as well as treatment of water supplies on Earth. The water purification is accomplished by introduction of molecular iodine into the water supply to impart a desired iodine residual. The water is passed through an iodinated anion exchange resin bed. The iodine is bound as I-(sub n) at the anion exchange sites and releases I(sub 2) into the water stream flowing through the bed. The concentration of I(sub 2) in the flowing water gradually decreases and, in the prior art, the ion-exchange bed has had to be replaced. In a preferred embodiment, a bed of iodine crystals is provided with connections for flowing water therethrough to produce a concentrated (substantially saturated) aqueous iodine solution which is passed through the iodinated resin bed to recharge the bed with bound iodine. The bed of iodine crystals

is connected in parallel with the iodinated resin bed and is activated periodically (e.g., by timer, by measured flow of water, or by iodine residual level) to recharge the bed. Novelty resides in the capability of inexpensively and repeatedly regenerating the ion-exchange bed in sites.

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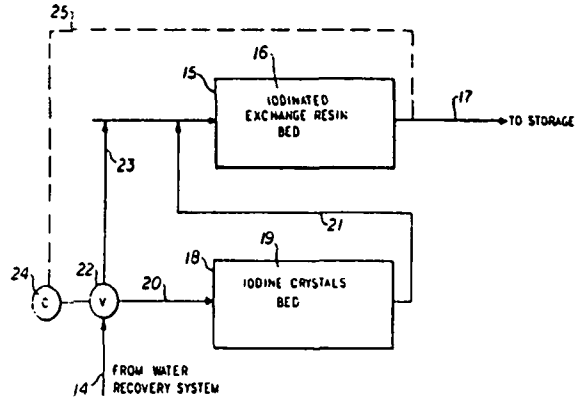


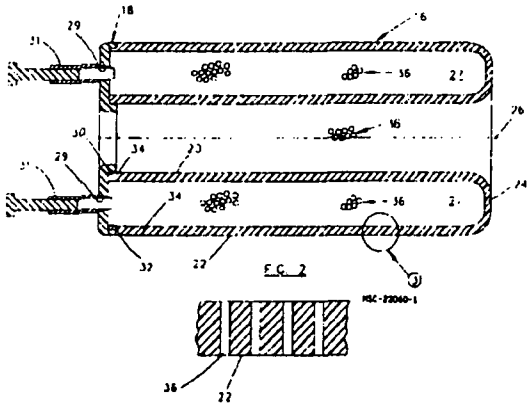
N93-19037*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

HIGH DENSITY CELL CULTURE SYSTEM Patent Application

GLENN SPAULDING, inventor (to NASA) 23 Dec. 1992 15 p (NASA-CASE-MSC-22060-1; NAS 1.71:MSC-22060-1; US-PATENT-APPL-SN-996263) Avail: CASI HC A03/MF A01

An annular culture vessel for growing mammalian cells is constructed in a one piece integral and annular configuration with an open end which is closed by an endcap. The culture vessel is rotatable about a horizontal axis by use of conventional roller systems commonly used in culture laboratories. The end wall of the endcap has tapered access ports to frictionally and sealingly receive the ends of hypodermic syringes. The syringes permit the introduction of fresh nutrient and withdrawal of spent nutrients. The walls are made of conventional polymeric cell culture material and are subjected to neutron bombardment to form minute gas permeable perforations in the walls.

NASA



N93-19054*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

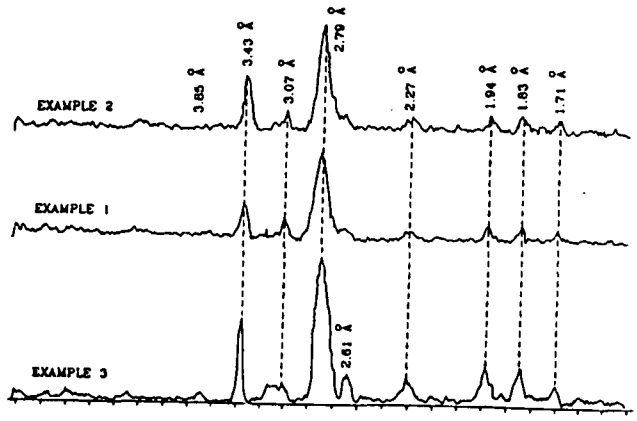
ACTIVE SYNTHETIC SOIL Patent Application

DOUGLAS W. MING, inventor (to NASA), DONALD L. HENNINGER, inventor (to NASA), EARL R. ALLEN, inventor (to NASA) (Oklahoma State Univ., Stillwater.), and DAGIGAMUWAGE C. GOLDEN, inventor (to NASA) (National Academy of Sciences - National Research Council, Houston, TX.) 16 Oct. 1992 26 p

(NASA-CASE-MSC-21954-1-NP; NAS 1.71:MSC-21954-1-NP; US-PATENT-APPL-SN-963349) Avail: CASI HC A03/MF A01

A synthetic soil/fertilizer for horticultural application having all the agronutrients essential for plant growth is disclosed. The soil comprises a synthetic apatite fertilizer having sulfur, magnesium, and micronutrients dispersed in a calcium phosphate matrix, a zeolite cation exchange medium saturated with a charge of potassium and nitrogen cations, and an optional pH buffer. Moisture dissolves the apatite and mobilizes the nutrient elements from the apatite matrix and the zeolite charge sites.

NASA



52

AEROSPACE MEDICINE

Includes physiological factors; biological effects of radiation; and effects of weightlessness on man and animals.

N93-14708* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

COMPLIANT WALKER Patent

JAMES J. KERLEY, inventor (to NASA), WAYNE D. EKLUND, inventor (to NASA), and J. ALLEN CRANE, inventor (to NASA) 29 Dec. 1992 12 p Filed 3 Jul. 1991 Supersedes N91-29714 (29 - 21, p 3548)

(NASA-CASE-GSC-13348-2; US-PATENT-5,174,590; US-PATENT-APPL-SN-725111; US-PATENT-CLASS-280-1.5; US-PATENT-CLASS-280-290; US-PATENT-CLASS-280-87.051; US-PATENT-CLASS-482-69; US-PATENT-CLASS-482-68; INT-PATENT-CLASS-B62D-51/04) Avail: US Patent and Trademark Office

A compliant walker is provided for humans having limited use of their legs and lower back. It includes an upright wheel frame which at least partially surrounds an upright user wearing a partial body harness. It is attached to the frame by means of cable compliant apparatus consisting of sets of cable segments and angle bracket members connected between opposite side members of the frame and adjacent side portions of the harness. Novelty is believed to exist in the combination of a wheeled frame including a side support

structure, a body harness, and compliance means connecting the body harness to the side support structure for flexibility holding and supporting a person in a substantially upright position when the user sags in the frame when taking weight off the lower extremities.

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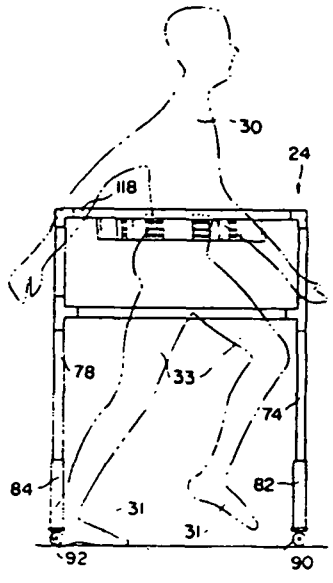


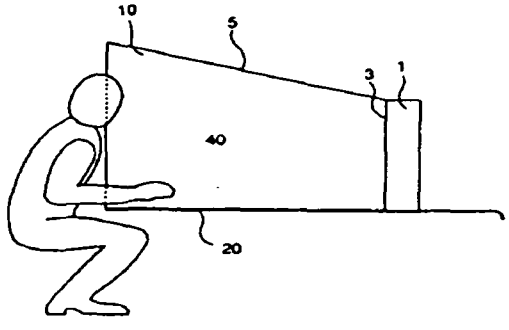
N93-17058*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

BRIGHT LIGHT DELIVERY SYSTEM Patent Application

BENITA C. HAYES, inventor (to NASA) 4 Dec. 1992 14 p (NASA-CASE-MFS-28723-1; NAS 1.71:MFS-28723-1; US-PATENT-APPL-SN-986631) Avail: CASI HC A03/MF A01

A bright light therapy delivery system is disclosed. The system enhances the efficient delivery of bright light therapy by directing the light to the user's eyes while permitting the user to engage in other sedentary activities, such as reading. A shroud is disclosed which has reflective non-specular interior surfaces and which enclosed a bright light source of known kind. The shroud can be configured for delivery of bright light therapy in a direct, indirect, or direct/indirect mode. In the direct mode, the bright light source is located at the back of the shroud and faces the user; in the indirect mode, the bright light source is located within the shroud and faces away from the user; in the direct/indirect mode, the bright light source is located within the shroud, and has two luminous appertures, one facing the user and the other facing lopposite the user.

NASA



54

MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT

Includes human engineering; biotechnology; and space suits and protective clothing.

N93-14713* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

PASSIVE ZERO-GRAVITY LEG RESTRAINT Patent

CHRISTOPHER R. MILLER, inventor (to NASA) (Southern California Inst. of Architecture, Santa Monica) 12 Sep. 1989 9 p Filed 6 Oct. 1988

(NASA-CASE-ARC-11882-1-CU; US-PATENT-4,865,270; US-PATENT-APPL-SN-254052; US-PATENT-CLASS-244-118.5; US-PATENT-CLASS-244-158R; US PATENT-CLASS-244-162; US-PATENT-CLASS-297-423; US-PATENT-CLASS-272-145; INT-PATENT-CLASS-B64G-1/60) Avail: US Patent and Trademark Office

A passive zero or microgravity leg restraint is described which includes a central support post with a top and a bottom. Extending from the central support post are a calf pad tab, to which calf pad is attached, and a foot pad tab, to which foot tab is attached. Also extending from central support post are knee pads. When the restraint is in use the user's legs are forced between pads by a user imposed scissors action of the legs. The user's body is then supported in a zero or microgravity neutral body posture by the leg restraint. The calf pad has semi-ridig elastic padding material covering structural stiffener. The foot pad has padding material and a structural stiffener. Knee pads have s structural tube stiffener at their core.

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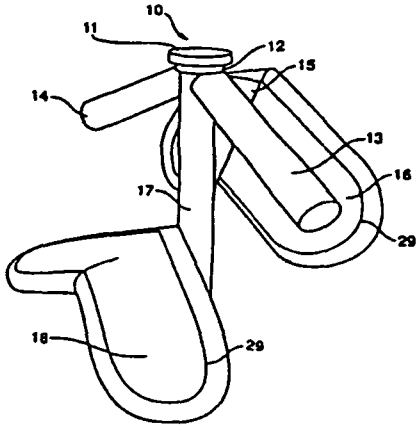

N93-14870* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

BAR-HOLDING PROSTHETIC LIMB Patent

THOMAS W. VEST, inventor (to NASA), WILLIAM E. NORTON, inventor (to NASA), JEWELL G. BELCHER, inventor (to NASA), and JAMES R. CARDEN, inventor (to NASA) 17 Nov. 1992 7 p Filed 15 Apr. 1992 Sponsored by NASA

(NASA-CASE-MFS-28481-1; US-PATENT-5,163,966; US-PATENT-APPL-SN-873931; US-PATENT-CLASS-623-65; US-PATENT-CLASS-623-57; INT-PATENT-CLASS-A61F-2/54) Avail: US Patent and Trademark Office

A prosthetic device for below-the-elbow amputees is disclosed. The device has a removable effector, which is attached to the end of an arm cuff. The effector is comprised of a pair of C-shaped members that are oriented so as to face each other. Working in concert, the C-shaped members are able to hold a bar such as a chainsaw handle. A flat spring is fitted around the C-shaped members to hold them together.

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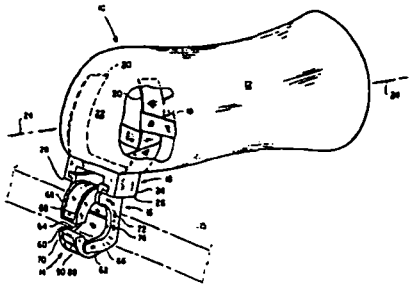


N93-17042*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

WHEELS FOR WHEELCHAIRS AND THE LIKE Patent Application

BRUCE WEDDENDORF, inventor (to NASA) and JEFFREY FINCKENOR, inventor (to NASA) 2 Nov. 1992 16 p (NASA-CASE-MFS-28632-1; NAS 1.71:MFS-28632-1; US-PATENT-APPL-SN-970204) Avail: CASI HC A03/MF A01

A wheel is provided herein for vehicles using spoked wheels. Small obstacles, steps, and curbs present serious impediments to wheelchair and bicycle travelers. Yet until recently wheels for these vehicles have remained unchanged. These rigid type vehicles have the disadvantage of transmitting to their users shocks and vibrations generated by traversing over obstacles or rough terrain, creating an uncomfortable ride. The wheel herein responds to loads or shocks while overcoming the difficulties of prior art wheels. The wheel is of the type having a circular rim with the hub at its center, and spokes connected between the hub and the rim. A wheel is provided in which not only the spokes are unique, but the rim as well.

NASA

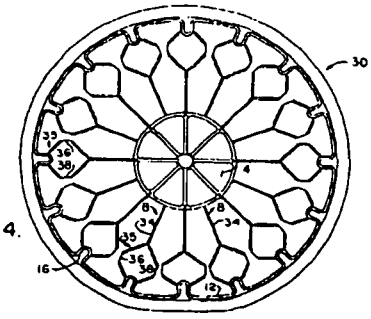


FIG.4.

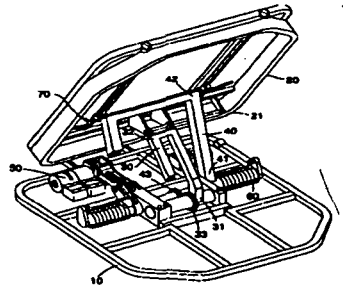
N93-17045*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

PORTABLE SEAT LIFT Patent Application

BRUCE WEDDENDORF, inventor (to NASA) 2 Nov. 1992 12 p (NASA-CASE-MFS-28610-1; NAS 1.71:MFS-28610-1; US-PATENT-APPL-SN-970203) Avail: CASI HC A03/MF A01

A portable seat lift that can help individuals either (1) lower themselves to a sitting position or (2) raise themselves to a standing position is presented. The portable seat lift consists of a seat mounted on a base with two levers, which are powered by a drive unit.

NASA



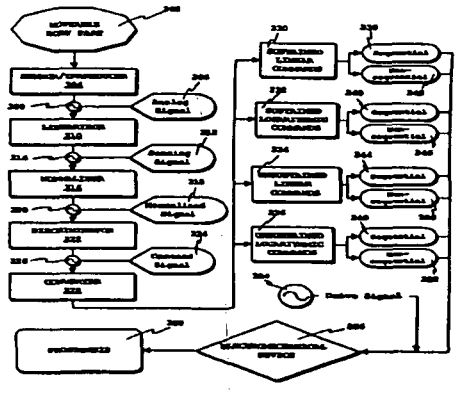
N93-17087*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

CONTROL SYSTEM AND METHOD FOR PROSTHETIC DEVICES Patent Application

RICHARD J. BOZEMAN, JR., inventor (to NASA) 31 Aug. 1992 23 p (NASA-CASE-MSC-21941-1; NAS 1.71:MSC-21941-1; US-PATENT-APPL-SN-937325) Avail: CASI HC A03/MF A01

A control system and method for prosthetic devices is provided. The control system comprises a transducer for receiving movement from a body part for generating a sensing signal associated with that movement. The sensing signal is processed by a linearizer for linearizing the sensing signal to be a linear function of the magnitude of the distance moved by the body part. The linearized sensing signal is normalized to be a function of the entire range of body part movement from the no-shrug position of the movable body part through the full-shrug position of the movable body part. The normalized signal is divided into a plurality of discrete command signals. The discrete command signals are used by typical converter devices which are in operational association with the prosthetic device. The converter device uses the discrete command signals for driving the movable portions of the prosthetic device and its sub-prosthesis. The method for controlling a prosthetic device associated with the present invention comprises the steps of receiving the movement from the body part, generating a sensing signal in association with the movement of the body part, linearizing the sensing signal to be a linear function of the magnitude of the distance moved by the body part, normalizing the linear signal to be a function of the entire range of the body part movement, dividing the normalized signal into a plurality of discrete command signals, and implementing the plurality of discrete command signals for driving the respective movable prosthesis device and its sub-prosthesis.

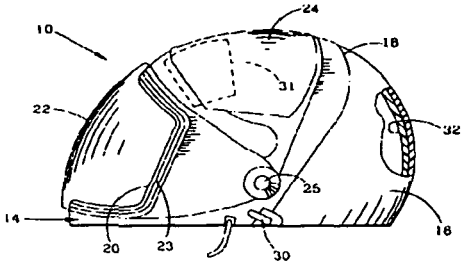
NASA



N93-17088*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.
PROTECTIVE HELMET ASSEMBLY Patent Application
FREDERIC S. DAWN, inventor (to NASA), FRED R. WEISS, inventor (to NASA), and JOHN D. ECK, inventor (to NASA) 4 Nov. 1992 12 p
(NASA-CASE-MSC-21842-1; NAS 1.71:MSC-21842-1; US-PATENT-APPL-SN-971116) Avail: CASI HC A03/MF A01

The invention is a protective helmet assembly with improved safety and impact resistance, high resistance to ignition and combustion, and reduced offgassing. The assembly comprises a hard rigid ballistic outer shell with one or more impact absorbing pads fitted to the interior surface. The pads are made of open cell flexible polyimide foam material, each of which is attached to the inner surface of the ballistic outer shell by cooperative VELCRO fastener strips of hook-and-loop material affixed respectively to the rigid outer shell and the impact absorbing pads. The helmet assembly with shell and pads is sized to fit relatively close over a wearer's head.

NASA



60

COMPUTER OPERATIONS AND HARDWARE

Includes hardware for computer graphics, firmware, and data processing.

N93-14704* National Aeronautics and Space Administration. Pasadena Office, CA.
HIGH SPEED MAGNETO-RESISTIVE RANDOM ACCESS MEMORY Patent
JIIN-CHUAN WU, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), HENRY L. STADLER, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), and ROMNEY R. KATTI, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 22 Dec. 1992 11 p Filed 28 Jun. 1990 Supersedes N90-26519 (28 - 20, p 2904)
(NASA-CASE-NPO-17954-1-CU; US-PATENT-5,173,873; US-PATENT-APPL-SN-545019; US-PATENT-CLASS-365-173; US-PATENT-CLASS-365-158; INT-PATENT-CLASS-G11C-11/15) Avail: US Patent and Trademark Office

A high speed read MRAM memory element is configured from a sandwich of magnetizable, ferromagnetic film surrounding a magneto-resistive film which may be ferromagnetic or not. One outer ferromagnetic film has a higher coercive force than the other and therefore remains magnetized in one sense while the other may be switched in sense by a switching magnetic field. The magneto-resistive film is therefore sensitive to the amplitude of the resultant field between the outer ferromagnetic films and may be constructed of a high resistivity, high magneto-resistive material capable of higher sensing currents. This permits higher read voltages and therefore faster read operations. Alternate embodiments with perpendicular anisotropy, and in-plane anisotropy are shown, including an embodiment which uses high permeability guides to direct the closing flux path through the magneto-resistive material. High density, high speed, radiation hard, memory matrices may be constructed from these memory elements.

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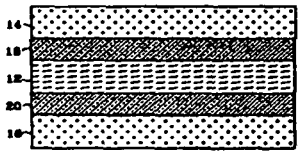


61

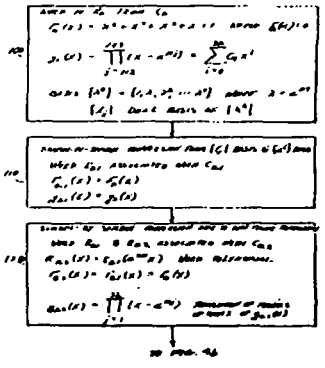
COMPUTER PROGRAMMING AND SOFTWARE

Includes computer programs, routines, and algorithms, and specific applications, e.g., CAD/CAM.

N93-11664*# National Aeronautics and Space Administration. Pasadena Office, CA.
MAPPINGS BETWEEN CODEWORDS OF TWO DISTINCT (N,K) REED-SOLOMON CODES OVER GF(2 SUP J) Patent Application
MARVIN PERLMAN, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 3 Sep. 1992 98 p
(Contract NAS7-918)
(NASA-CASE-NPO-187711CU; NAS1.71:NPO-18771-1-CU; US-PATENT-APPL-SN-942500) Avail: CASI HC A05/MF A02

A process for realizing mappings between code-words of two distinct (N,K) Reed-Solomon (RS) codes over GF(2 sup J) having selected two independent parameters: J, specifying the number of bits per symbol; and E(sub 1), the symbol error correction capability of the code, wherein said independent parameters J and E yield the following: N = 2(sup J)-1 total number of symbols per codeword; 2E, the number of symbols assigned a role of check symbols; and K-N-2E, the number of code symbols representing information, all within a codeword of an (N,K) RS code over GF(2 sup J), and having selected said parameters for encoding, the implementation of a decoder are governed by: 2(sup J) field elements defined by a degree J primitive polynomial over GF(2) denoted by F(x); a code generator polynomial of degree 2E containing 2E consecutive roots of a primitive element defined by F(x); and, in a Berlekamp RS code, the basis in which the RS information and check symbols are represented. The process includes separate transformation steps for symbol-by-symbol conversion for a first RS code to ultimately a second conventional RS code capable of being corrected by a conventional RS decoder, followed by a reverse sequence of the inverse of the first set of steps to arrive at codewords having connected information symbols, at which time check symbols of the RS code may be discarded.

NASA



N93-14882* National Aeronautics and Space Administration. Pasadena Office, CA.

MODIFIED FAST FREQUENCY ACQUISITION VIA ADAPTIVE LEAST SQUARES ALGORITHM Patent

RAJENDRA KUMAR, inventor (to NASA) 17 Nov. 1992 10 p Filed 27 Nov. 1991 Continuation-in-part of abandoned US-Patent-Appl-SN-523692, filed 15 May 1990

(NASA-CASE-NPO-17845-2-CU; US-PATENT-5,165,051; US-PATENT-APPL-SN-799857; US-PATENT-CLASS-324-79D; US-PATENT-CLASS-324-79R; US-PATENT-CLASS-324-83Q; US-PATENT-CLASS-364-724.06; US-PATENT-CLASS-364-724.07; US-PATENT-CLASS-364-724.08; US-PATENT-CLASS-342-100) Avail: US Patent and Trademark Office

A method and the associated apparatus for estimating the amplitude, frequency, and phase of a signal of interest are presented. The method comprises the following steps: (1) inputting the signal of interest; (2) generating a reference signal with adjustable amplitude, frequency and phase at an output thereof; (3) mixing the signal of interest with the reference signal and a signal 90 deg out of phase with the reference signal to provide a pair of quadrature sample signals comprising respectively a difference between the signal of interest and the reference signal and a difference between the signal of interest and the signal 90 deg out of phase with the reference signal; (4) using the pair of quadrature sample signals to compute estimates of the amplitude, frequency, and phase of an error signal comprising the difference between the signal of interest and the reference signal employing a least squares estimation; (5) adjusting the amplitude, frequency, and phase of the reference signal from the numerically controlled oscillator in a manner which drives the error signal towards zero; and (6) outputting the estimates of the amplitude, frequency, and phase of the error signal in combination with the reference signal to produce a best estimate of the amplitude, frequency, and phase of the signal of interest. The preferred method includes the step of providing the error signal as a real time confidence measure as to the accuracy of the estimates wherein the closer the error signal is to zero, the higher the probability that the estimates are accurate. A matrix in the estimation algorithm provides an estimate of the variance of the estimation error.

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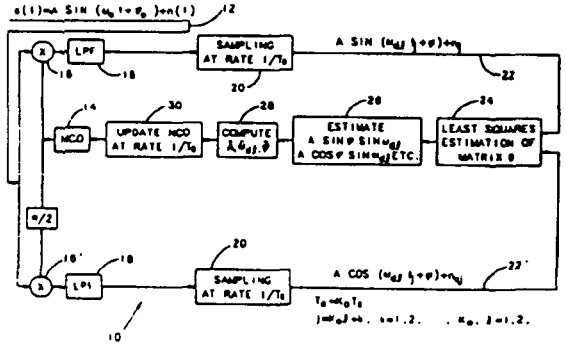

N93-18282* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

GENERAL METHOD OF PATTERN CLASSIFICATION USING THE TWO-DOMAIN THEORY Patent

MARK E. RORVIG, inventor (to NASA) 19 Jan. 1993 11 p Filed 25 Sep. 1990 Supersedes N91-13911 (29 - 5, p 702)

(NASA-CASE-MSC-21737-1; US-PATENT-5,181,259; US-PATENT-APPL-SN-587922; US-PATENT-CLASS-382-36; US-PATENT-CLASS-382-1; US-PATENT-CLASS-382-6; INT-PATENT-CLASS-G06K-9/00) Avail: US Patent and Trademark Office

Human beings judge patterns (such as images) by complex mental processes, some of which may not be known, while computing machines extract features. By representing the human judgments with simple measurements and reducing them and the machine extracted features to a common metric space and fitting them by regression, the judgements of human experts rendered on a sample of patterns may be imposed on a pattern population to provide automatic classification.

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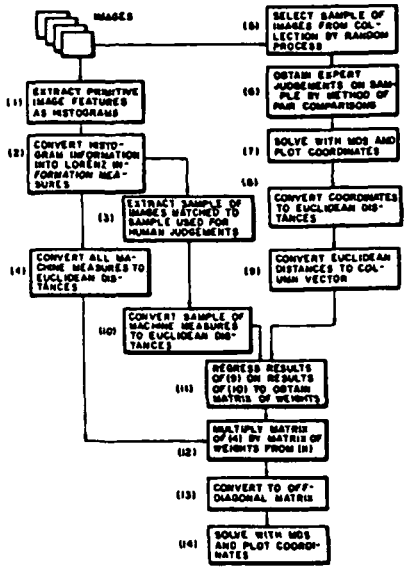

N93-18855* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

SYSTEM FOR SIMULTANEOUSLY LOADING PROGRAM TO MASTER COMPUTER MEMORY DEVICES AND CORRESPONDING SLAVE COMPUTER MEMORY DEVICES Patent

WILLIAM A. HALL, inventor (to NASA) 16 Feb. 1993 16 p Filed 15 Mar. 1989 Supersedes N90-16411 (28 - 8, p 1108)

(NASA-CASE-MSC-21387-1; US-PATENT-5,187,794; US-PATENT-APPL-SN-323748; US-PATENT-CLASS-395-800; US-PATENT-CLASS-364-DIG.1; US-PATENT-CLASS-364-229; US-PATENT-CLASS-364-240; US-PATENT-CLASS-364-243; US-PATENT-CLASS-364-187; US-PATENT-CLASS-395-500) Avail: US Patent and Trademark Office

A bus programmable slave module card for use in a computer control system is disclosed which comprises a master computer and one or more slave computer modules interfacing by means of a bus. Each slave module includes its own microprocessor, memory, and control program for acting as a single loop controller. The slave card includes a plurality of memory means (S1, S2...) corresponding to a like plurality of memory devices (C1, C2...) in the master computer, for each slave memory means its own communication lines connectable through the bus with memory communication lines of an associated memory device in the master computer, and a one-way electronic door which is switchable to either a closed condition or a one-way open condition. With the door closed, communication lines between master computer memory (C1, C2...) and slave memory (S1, S2...) are blocked. In the one-way open condition invention, the memory communication lines or each slave memory means (S1, S2...) connect with the memory communication lines of its associated

memory device (C1, C2...) in the master computer, and the memory devices (C1, C2...) of the master computer and slave card are electrically parallel such that information seen by the master's memory is also seen by the slave's memory. The slave card is also connectable to a switch for electronically removing the slave microprocessor from the system. With the master computer and the slave card in programming mode relationship, and the slave microprocessor electronically removed from the system, loading a program in the memory devices (C1, C2...) of the master accomplishes a parallel loading into the memory devices (S1, S2...) of the slave.

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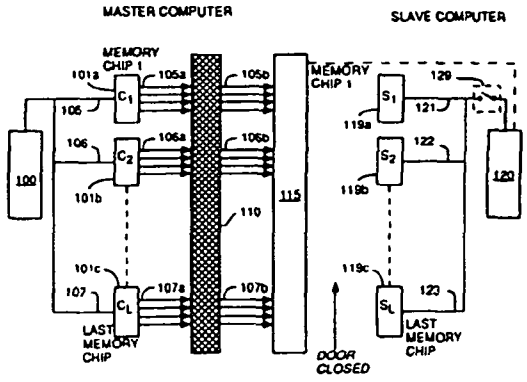

N93-18858* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

DYNAMIC PATTERN MATCHER USING INCOMPLETE DATA Patent

GORDON G. JOHNSON, inventor (to NASA) and LUI WANG, inventor (to NASA) 23 Feb. 1993 22 p Filed 26 Aug. 1991 Supersedes N92-17860 (30 - 8, p 1344)

(NASA-CASE-MSC-21415-1-SB; US-PATENT-5,189,709; US-PATENT-APPL-SN-749819; US-PATENT-CLASS-382-10; US-PATENT-CLASS-382-30; US-PATENT-CLASS-381-43; INT-PATENT-CLASS-G06K-9/00) Avail: US Patent and Trademark Office

This invention relates generally to pattern matching systems, and more particularly to a method for dynamically adapting the system to enhance the effectiveness of a pattern match. Apparatus and methods for calculating the similarity between patterns are known. There is considerable interest, however, in the storage and retrieval of data, particularly, when the search is called or initiated by incomplete information. For many search algorithms, a query initiating a data search requires exact information, and the data file is searched for an exact match. Inability to find an exact match thus results in a failure of the system or method.

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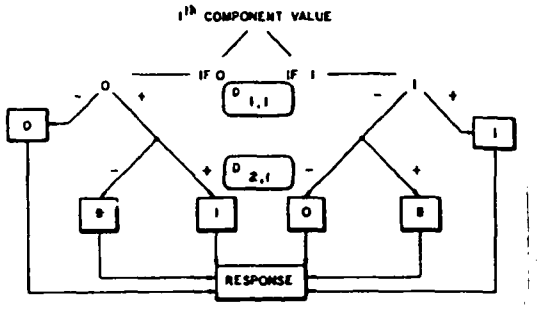


63

CYBERNETICS

Includes feedback and control theory, artificial intelligence, robotics and expert systems.

N93-11174*# National Aeronautics and Space Administration. Pasadena Office, CA.

THE ADAPTIVE NEURON MODEL: AN ARCHITECTURE FOR THE RAPID LEARNING OF NONLINEAR TOPOLOGICAL TRANSFORMATIONS Patent Application

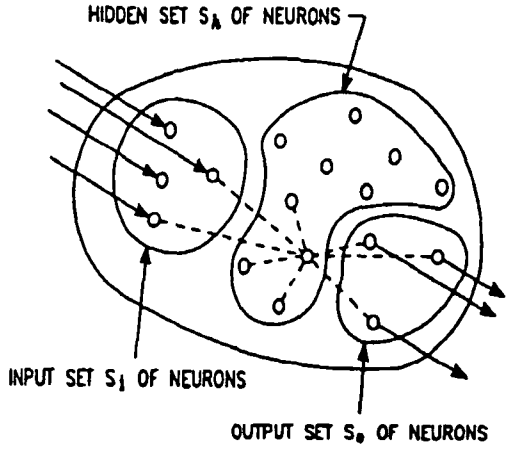
RAOUL TAWEL, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 28 Aug. 1992 34 p

(Contract NAS7-918)

(NASA-CASE-NPO-18579-1-CU; NAS 1.71:NPO-18579-1-CU; US-PATENT-APPL-SN-937335) Avail: CASI HC A03/MF A01

A method for the rapid learning of nonlinear mappings and topological transformations using a dynamically reconfigurable artificial neural network is presented. This fully-recurrent Adaptive Neuron Model (ANM) network was applied to the highly degenerate inverse kinematics problem in robotics, and its performance evaluation is bench-marked. Once trained, the resulting neuromorphic architecture was implemented in custom analog neural network hardware and the parameters capturing the functional transformation downloaded onto the system. This neuroprocessor, capable of 10(exp 9) ops/sec, was interfaced directly to a three degree of freedom Heathkit robotic manipulator. Calculation of the hardware feedforward pass for this mapping was benchmarked at approximately 10 microsec.

NASA



N93-14701* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

DRIVEN SHIELDING CAPACITIVE PROXIMITY SENSOR Patent

JOHN M. VRANISH, inventor (to NASA) and ROBERT L. MCCONNELL, inventor (to NASA) 24 Nov. 1992 5 p Filed 6 Jun. 1991 Supersedes N91-28785 (29 - 20, p 3390)

(NASA-CASE-GSC-13377-1; US-PATENT-5,166,679; US-PATENT-APPL-SN-710845; US-PATENT-CLASS-340-870.37; US-PATENT-CLASS-324-687; US-PATENT-CLASS-340-562; INT-PATENT-CLASS-G08C-19/10; INT-PATENT-CLASS-G08B-13/26) Avail: US Patent and Trademark Office

A capacitive proximity sensing element, backed by a reflector driven at the same voltage as and in phase with the sensor, is used to reflect the field lines away from a grounded robot arm towards an intruding object, thus dramatically increasing the senors's range and sensitivity.

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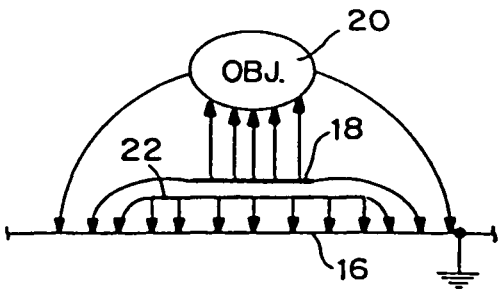


N93-17056*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

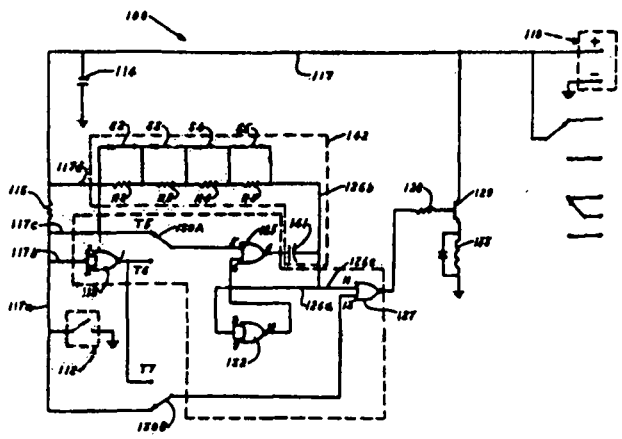
MEASURAND TRANSIENT SIGNAL SUPPRESSOR Patent Application

RICHARD J. BOZEMAN, JR., inventor (to NASA) 2 Oct. 1992 17 p

(NASA-CASE-MSC-22027-1; NAS 1.71:MSC-22027-1; US-PATENT-APPL-SN-955801) Avail: CASI HC A03/MF A01

A transient signal suppressor for use in a controls system which is adapted to respond to a change in a physical parameter whenever it crosses a predetermined threshold value in a selected direction of increasing or decreasing values with respect to the threshold value and is sustained for a selected discrete time interval is presented. The suppressor includes a sensor transducer for sensing the physical parameter and generating an electrical input signal whenever the sensed physical parameter crosses the threshold level in the selected direction. A manually operated switch is provided for adapting the suppressor to produce an output drive signal whenever the physical parameter crosses the threshold value in the selected direction of increasing or decreasing values. A time delay circuit is selectively adjustable for suppressing the transducer input signal for a preselected one of a plurality of available discrete suppression time and producing an output signal only if the input signal is sustained for a time greater than the selected suppression time. An electronic gate is coupled to receive the transducer input signal and the timer output signal and produce an output drive signal for energizing a control relay whenever the transducer input is a non-transient signal which is sustained beyond the selected time interval.

NASA



N93-17275*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.

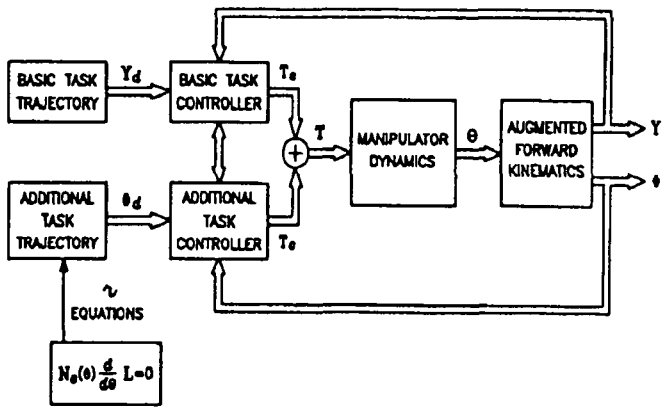
NEW KINEMATIC FUNCTIONS FOR REDUNDANCY RESOLUTION USING CONFIGURATION CONTROL Patent Application

HOMAYOUN SERAJI, inventor (to NASA) 27 Oct. 1992 54 p

(NASA-CASE-NPO-18608-1-CU; NAS 1.71:NPO-18608-1-CU; US-PATENT-APPL-SN-967083) Avail: CASI HC A04/MF A01

The invention fulfills new goals for redundancy resolution based on manipulator dynamics and end-effector characteristics. These goals are accomplished by employing the recently developed configuration control approach. Redundancy resolution is achieved by controlling the joint inertia matrix of the end-effector mass matrix that affect the inertial torques, or by reducing the joint torques due to gravity loading and payload. The manipulator mechanical-advantage and velocity-ratio are also used as performance measures to be improved by proper utilization of redundancy. Furthermore, end-effector compliance, sensitivity, and impulsive force at impact are introduced as redundancy resolution criteria. The new goals for redundancy resolution allow a more efficient utilization of the redundant joints based on the desired task requirements.

NASA



N93-17276*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.

NEURAL NETWORK TRAINING BY INTEGRATION OF ADJOINT SYSTEMS OF EQUATIONS FORWARD IN TIME Patent Application

NIKZAD TOOMARIAN, inventor (to NASA) and JACOB BARHEN, inventor (to NASA) 27 Oct. 1992 31 p

(NASA-CASE-NPO-18586-1-CU; NAS 1.71:NPO-18586-1-CU; US-PATENT-APPL-SN-969868) Avail: CASI HC A03/MF A01

A method and apparatus for supervised neural learning of time dependent trajectories exploits the concepts of adjoint operators to enable computation of the gradient of an objective functional with respect to the various parameters of the network architecture in a highly efficient manner. Specifically, it combines the advantage of dramatic reductions in computational complexity inherent in adjoint methods with the ability to solve two adjoint systems of equations together forward in time. Not only is a large amount of computation and storage saved, but the handling of real-time applications becomes also possible. The invention has been applied it to two examples of representative complexity which have recently been analyzed in the open literature and demonstrated that a circular trajectory can be learned in approximately 200 iterations compared to the 12000 reported in the literature. A figure eight trajectory was

achieved in under 500 iterations compared to 20000 previously required. The trajectories computed using our new method are much closer to the target trajectories than was reported in previous studies.

NASA

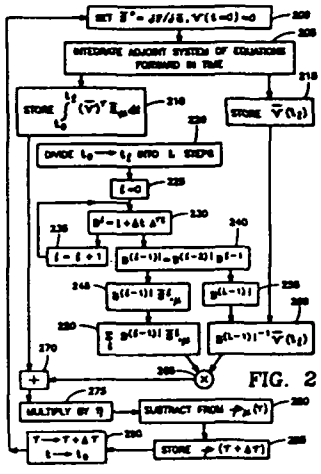


FIG. 2

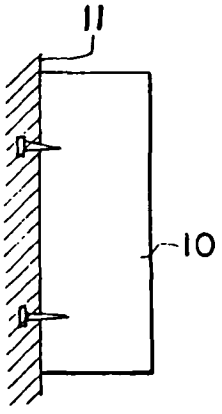
N93-19024*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

NUMERICAL CONTROL FABRICATION TECHNIQUE FOR DYNAMIC COMPOSITE MODELS Patent Application

JOHN B. KOVTUN, inventor (to NASA) 29 Jan. 1991 11 p (NASA-CASE-LAR-14004-1; NAS 1.71:LAR-14004-1; US-PATENT-APPL-SN-647097) Avail: CASI HC A03/MF A01

In a method of fabricating an article such as a dynamic model or a part thereof, a computer-driven machining means, such as a numerically controlled machine, is used to cut a core material such as a rigid foam into a desired shape and to a size specification that is slightly smaller than the final size desired to the article. Alternating layers of a polymer resin such as polyester and a reinforcing fabric such as fiberglass cloth are then applied to the surface of the core material, causing a build-up of layers of polymer resin and reinforcing fabric to a point at which the item being fabricated is oversized from that desired. Finally, a computer-driven machining means is used to cut the article being fabricated to exact size and shape specifications, leaving a desired thickness of reinforcing material.

NASA



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ACOUSTICS

Includes sound generation, transmission, and attenuation.

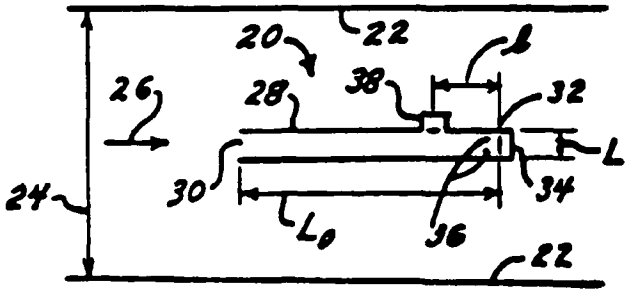
N93-13421* National Aeronautics and Space Administration. Pasadena Office, CA.

ACOUSTIC DEVICE AND METHOD FOR MEASURING GAS DENSITIES Patent

PARTHASARATHY SHAKKOTTAI, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), EUG Y. KWACK, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), and LLOYD BACK, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 3 Nov. 1992 19 p Filed 19 Feb. 1991 Supersedes N92-10609 (30 - 1, p 105) (NASA-CASE-NPO-18155-1-CU; US-PATENT-5,159,843; US-PATENT-APPL-SN-658477; US-PATENT-CLASS-73-24.05; US-PATENT-CLASS-73-24.06; US-PATENT-CLASS-73-24.01; INT-PATENT-CLASS-G01N-29/00; INT-PATENT-CLASS-G01N-29/22) Avail: US Patent and Trademark Office

Density measurements can be made in a gas contained in a flow through enclosure by measuring the sound pressure level at a receiver or microphone located near a dipole sound source which is driven at constant velocity amplitude at low frequencies. Analytical results, which are provided in terms of geometrical parameters, wave numbers, and sound source type for systems of this invention, agree well with published data. The relatively simple designs feature a transmitter transducer at the closed end of a small tube and a receiver transducer on the circumference of the small tube located a small distance away from the transmitter. The transmitter should be a dipole operated at low frequency with the kL value preferable less that about 0.3.

Official Gazette of the U.S. Patent and Trademark Office



N93-17051*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

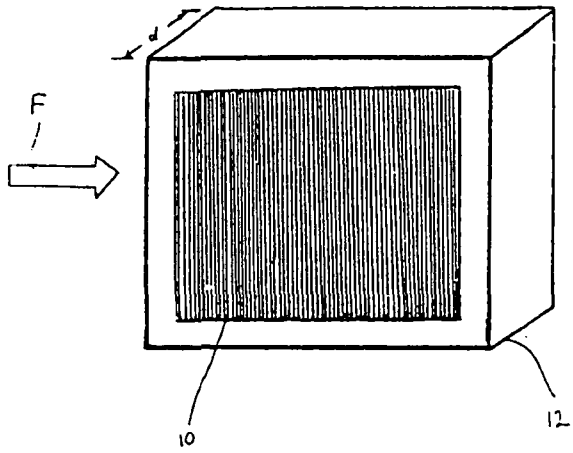
CONSECUTIVE PLATE ACOUSTIC SUPPRESSOR APPARATUS AND METHODS Patent Application

JOSEPH DOYCHAK, inventor (to NASA) and TONY PARROTT, inventor (to NASA) 16 Oct. 1992 20 p (NASA-CASE-LEW-15430-1; NAS 1.71:LEW-15430-1; US-PATENT-APPL-SN-961943) Avail: CASI HC A03/MF A01

An apparatus and method for suppressing acoustic noise utilizes consecutive plates, closely spaced to each other so as to exploit dissipation associated with sound propagation in narrow channels to optimize the acoustic resistance at a liner surface. The closely

spaced plates can be utilized as high temperature structural materials for jet engines by constructing the plates from composite materials. Geometries of the plates, such as plate depth, shape, thickness, inter-plate spacing, arrangement, etc., can be selected to achieve bulk material-like behavior.

NASA



72

ATOMIC AND MOLECULAR PHYSICS

Includes atomic structure, electron properties, and molecular spectra.

N93-19026*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

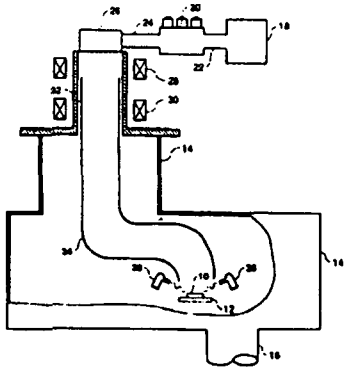
METHOD AND APPARATUS FOR PRODUCING A THERMAL ATOMIC OXYGEN BEAM Patent Application

B. A. BANKS, inventor (to NASA) and S. K. RUTLEDGE, inventor (to NASA) 25 Jan. 1993 11 p

(NASA-CASE-LEW-15614-1; NAS 1.71:LEW-15614-1; US-PATENT-APPL-SN-008026) Avail: CASI HC A03/MF A01

Atomic oxygen atoms are routed to a material through a sufficiently tortuous path so that vacuum ultraviolet radiation is obstructed from arriving at the surface of the material. However, the material surface continues to be exposed to the atomic oxygen.

NASA



74

OPTICS

Includes light phenomena; and optical devices.

N93-11058* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

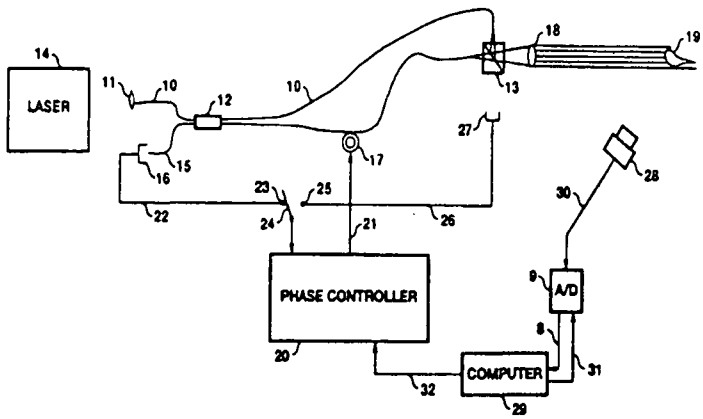
PHASE-STEPPING FIBER-OPTIC PROJECTED FRINGE SYSTEM FOR SURFACE TOPOGRAPHY MEASUREMENTS Patent

CAROLYN R. MERCER, Inventor (to NASA) and GLENN BEHEIM, inventor (to NASA) 8 Sep. 1992 6 p Filed 13 May 1991

(NASA-CASE-LEW-14996-1; US-PATENT-5,146,293; US-PATENT-APPL-SN-703435; US-PATENT-CLASS-356-356; US-PATENT-CLASS-356-360; US-PATENT-CLASS-356-376; US-PATENT-CLASS-382-26; US-PATENT-CLASS-364-575; INT-PATENT-CLASS-G01B-11/02) Avail: US Patent and Trademark Office

A projected fringe interferometer for measuring the topography of an object is presented. The interferometer periodically steps the phase angle between a pair of light beams emanating from a common source. The steps are pi/2 radians (90 deg) apart, and at each step a video image of the fringes is recorded and stored. Photodetectors measure either the phase and theta of the beams or 2(theta). Either of the measures can be used to control one of the light beams so that the 90 deg theta is accurately maintained. A camera, a computer, a phase controller, and a phase modulator established closed-loop control of theta. Measuring the phase map of a flat surface establishes a calibration reference.

Official Gazette of the U.S. Patent and Trademark Office



N93-13419* National Aeronautics and Space Administration. Pasadena Office, CA.

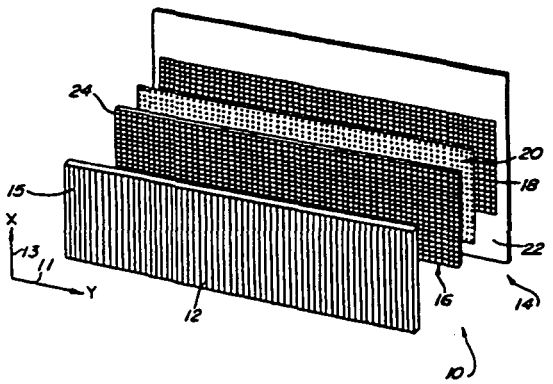
INTEGRATED FILTER AND DETECTOR ARRAY FOR SPECTRAL IMAGING Patent

CLAYTON C. LABAW, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 27 Oct. 1992 10 p Filed 12 Aug. 1991 Supersedes N91-32926 (29 - 24, p 4103)

(NASA-CASE-NPO-18317-1-CU; US-PATENT-5,159,199; US-PATENT-APPL-SN-744197; US-PATENT-CLASS-250-339; US-PATENT-CLASS-356-328; US-PATENT-CLASS-357-30; US-PATENT-CLASS-359-859; INT-PATENT-CLASS-G01N-21/27; INT-PATENT-CLASS-G02B-5/20) Avail: US Patent and Trademark Office

A spectral imaging system having an integrated filter and photodetector array is disclosed. The filter has narrow transmission bands which vary in frequency along the photodetector array. The frequency variation of the transmission bands is matched to, and aligned with, the frequency variation of a received spectral image. The filter is deposited directly on the photodetector array by a low temperature deposition process. By depositing the filter directly on the photodetector array, permanent alignment is achieved for all temperatures, spectral crosstalk is substantially eliminated, and a high signal to noise ratio is achieved.

Official Gazette of the U.S. Patent and Trademark Office



N93-13711* National Aeronautics and Space Administration. Pasadena Office, CA.

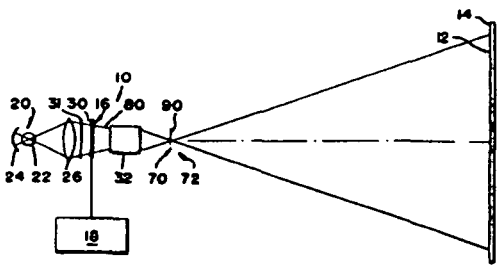
LARGE AREA PROJECTION LIQUID-CRYSTAL VIDEO DISPLAY SYSTEM WITH INHERENT GRID PATTERN OPTICALLY REMOVED Patent

HUA-KUANG LIU, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 3 Nov. 1992 4 p Filed 21 Dec. 1990 Continuation of abandoned application US-Patent-Appl-SN-913433, filed 30 Sep. 1986

(NASA-CASE-NPO-16932-2-CU; US-PATENT-5,161,027; US-PATENT-APPL-SN-632408; US-PATENT-APPL-SN-913433; US-PATENT-CLASS-358-231; US-PATENT-CLASS-358-61; US-PATENT-CLASS-358-232; INT-PATENT-CLASS-H04N-5/74; INT-PATENT-CLASS-H04N-9/31) Avail: US Patent and Trademark Office

A relatively small and low-cost system is provided for projecting a large and bright television image onto a screen. A miniature liquid crystal array is driven by video circuitry to produce a pattern of transparencies in the array corresponding to a television image. Light is directed against the rear surface of the array to illuminate it, while a projection lens lies in front of the array to project the image of the array onto a large screen. Grid lines in the liquid crystal array are eliminated by a spacial filter which comprises a negative of the Fourier transform of the grid.

Official Gazette of the U.S. Patent and Trademark Office



N93-14404*# National Aeronautics and Space Administration. Pasadena Office, CA.

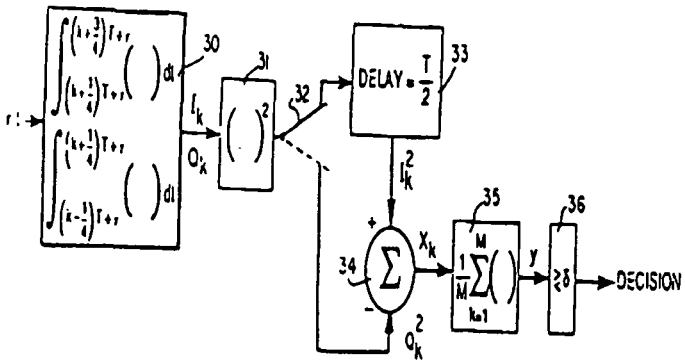
REAL-TIME EDGE-ENHANCED OPTICAL CORRELATOR Patent Application

MAZEN M. SHIHABI, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), SAMI M. HINEDI, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.), and BIREN N. SHAH, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 4 Aug. 1992 50 p (Contract NAS7-918)

(NASA-CASE-NPO-18521-1-CU; NAS 1.71:NPO-18521-1-CU; US-PATENT-APPL-SN-934078) Avail: CASI HC A03/MF A01

The performance of five symbol lock detectors are compared. They are the square-law detector with overlapping (SQOD) and non-overlapping (SQNOD) integrators, the absolute value detectors with overlapping and non-overlapping (AVNOD) integrators and the signal power estimator detector (SPED). The analysis considers various scenarios when the observation interval is much larger or equal to the symbol synchronizer loop bandwidth, which has not been considered in previous analyses. Also, the case of threshold setting in the absence of signal is considered. It is shown that the SQOD outperforms all others when the threshold is set in the presence of signal, independent of the relationship between loop bandwidth and observation period. On the other hand, the SPED outperforms all others when the threshold is set in the presence of noise only.

NASA



N93-14711* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

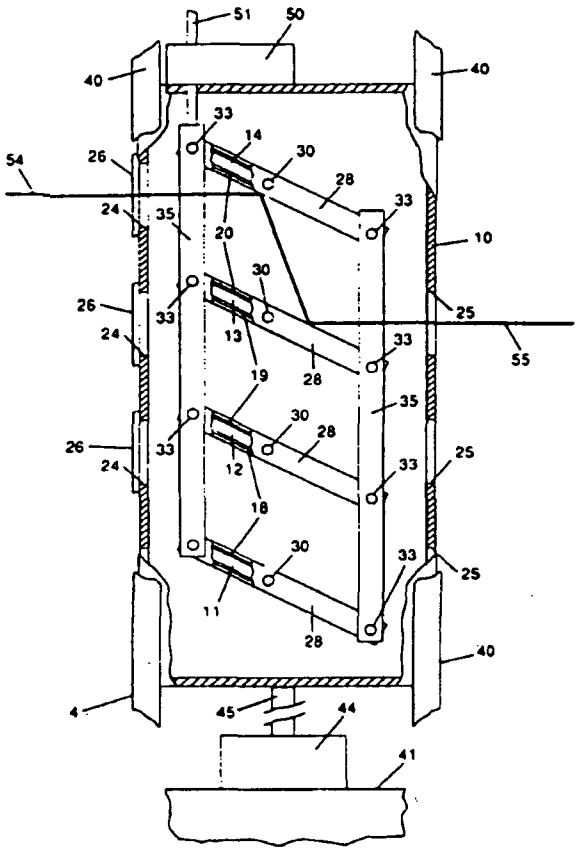
X-RAY MONOCHROMATOR Patent

RICHARD B. HOOVER, inventor (to NASA) 22 Dec. 1992 5 p (NASA-CASE-MFS-28492-1; US-PATENT-5,173,930; US-PATENT-APPL-SN-803268; US-PATENT-CLASS-378-85; US-PATENT-CLASS-378-145; INT-PATENT-CLASS-G21K-1/06) Avail: US Patent and Trademark Office

An x-ray monochromator is described, wherin a housing supports a plurality of mirrors forming a plurality of opposed mirror faces in parallel with each other and having thereon multilayer coatings, with each of said pairs of mirror faces being provided with identical coatings which are different from the coatings on the other pairs of mirror faces such that each pair of mirror faces has a peak x-ray reflection at a different wavelength regime. The housing is moveable to bring into a polychromatic x-ray beam that pair of mirror faces

having the best x-ray reflection for the desired wavelength, with the mirrors being pivotable to move the mirror faces to that angle of incidence at which the peak reflectivity of the desired wavelength x-rays occurs.

Official Gazette of the U.S. Patent and Trademark Office



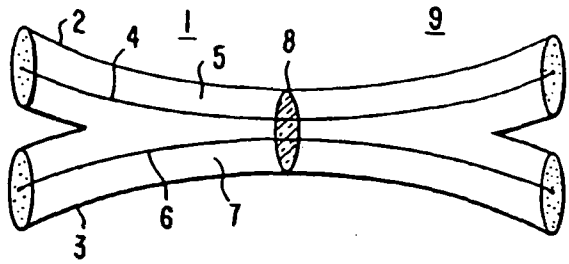
N93-17052*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

AN INTERFEROMETER HAVING FUSED OPTICAL FIBERS, AND APPARATUS AND METHOD USING THE INTERFEROMETER Patent Application

RICHARD F. HELLBAUM, inventor (to NASA), RICHARD O. CLAUS, inventor (to NASA), KENT A. MURPHY, inventor (to NASA), and MICHAEL F. GUNTHER, inventor (to NASA) 1 Oct. 1992 25 p (NASA-CASE-LAR-14640-1-CU; NAS 1.71:LAR-14640-1-CU; US-PATENT-APPL-SN-956685) Avail: CASI HC A03/MF A01

An interferometer includes a first optical fiber coupled to a second optical fiber by fusing. At a fused portion, the first and second optical fibers are cut to expose respective cores. The cut or fused end of the first and second optical fibers is arranged to oppose a diaphragm or surface against which a physical phenomenon such as pressure or stress, is applied. In a first embodiment, a source light which is generally single-mode monochromatic, coherent light, is input to the first optical fiber and by evanescence, effectively crosses to the second optical fiber at the fused portion. Source light from the second optical fiber is reflected by the diaphragm or surface, and received at the second optical fiber to generate an output light which has an intensity which depends upon interference of reference light based on the source light, and the reflected light reflected from the diaphragm or surface. The intensity of the output light represents a positional relationship or displacement between the interferometer and the diaphragm or surface.

NASA



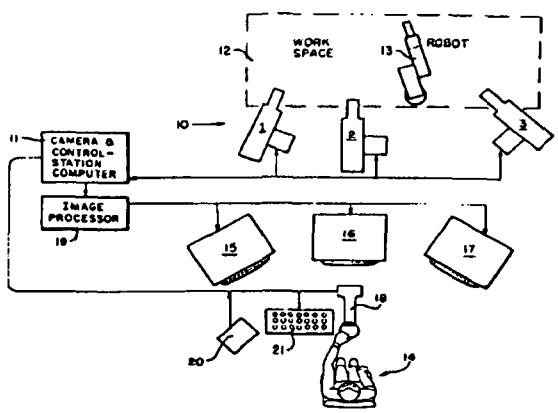
N93-17273*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.

OPERATOR-TAILORED ADJUSTABLE CONTROL STATION WITH MOVABLE MONITORS AND CAMERAS FOR VIEWING SYSTEMS IN ROBOTICS AND TELEOPERATIONS Patent Application

DANIEL B. DINER, inventor (to NASA) 28 Sep. 1992 33 p (NASA-CASE-NPO-17837-1-CU; NAS 1.71:NPO-17837-1-CU; US-PATENT-APPL-SN-954109) Avail: CASI HC A03/MF A01

Real-time video presentations are provided in the field of operator-supervised automation and teleoperation, particularly in control stations having movable cameras for optimal viewing of a region of interest in robotics and teleoperations for performing different types of tasks. Movable monitors to match the corresponding camera orientations (pan, tilt, and roll) are provided in order to match the coordinate systems of all the monitors to the operator internal coordinate system. Automated control of the arrangement of cameras and monitors, and of the configuration of system parameters, is provided for optimal viewing and performance of each type of task for each operator since operators have different individual characteristics. The optimal viewing arrangement and system parameter configuration is determined and stored for each operator in performing each of many types of tasks in order to aid the automation of setting up optimal arrangements and configurations for successive tasks in real time. Factors in determining what is optimal include the operator's ability to use hand-controllers for each type of task. Robot joint locations, forces and torques are used, as well as the operator's identity, to identify the current type of task being performed in order to call up a stored optimal viewing arrangement and system parameter configuration.

NASA



N93-18276* National Aeronautics and Space Administration. Pasadena Office, CA.

NEAR REAL-TIME STEREO VISION SYSTEM Patent

CHARLES H. ANDERSON, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) and LARRY H. MATTHIES, inventor (to NASA) 12 Jan. 1993 23 p Filed 18 Dec. 1991 Supersedes N92-17864 (30 - 8, p 1368)

(Contract NAS7-918)

(NASA-CASE-NPO-18593-1-CU; US-PATENT-5,179,441; US-PATENT-APPL-SN-812901; US-PATENT-CLASS-358-88; US-PATENT-CLASS-358-133; INT-PATENT-CLASS-H04N-13/00; INT-PATENT-CLASS-H04N-7/133) Avail: US Patent and Trademark Office

The apparatus for a near real-time stereo vision system for use with a robotic vehicle is described. The system is comprised of two cameras mounted on three-axis rotation platforms, image-processing boards, a CPU, and specialized stereo vision algorithms. Bandpass-filtered image pyramids are computed, stereo matching is performed by least-squares correlation, and confidence ranges are estimated by means of Bayes' theorem. In particular, Laplacian image pyramids are built and disparity maps are produced from the 60 x 64 level of the pyramids at rates of up to 2 seconds per image pair. The first autonomous cross-country robotic traverses (of up to 100 meters) have been achieved using the stereo vision system of the present invention with all computing done onboard the vehicle. The overall approach disclosed herein provides a unifying paradigm for practical domain-independent stereo ranging.

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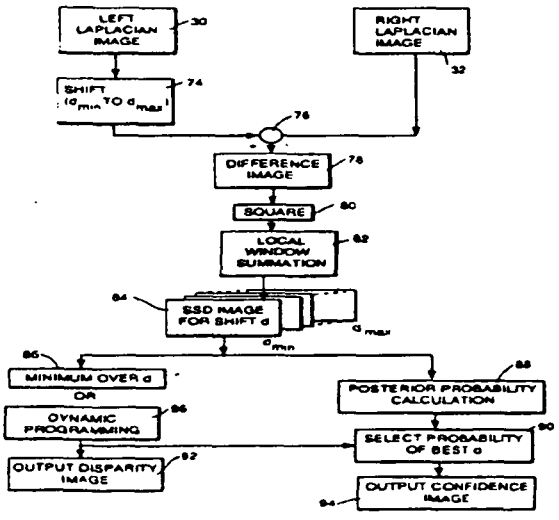


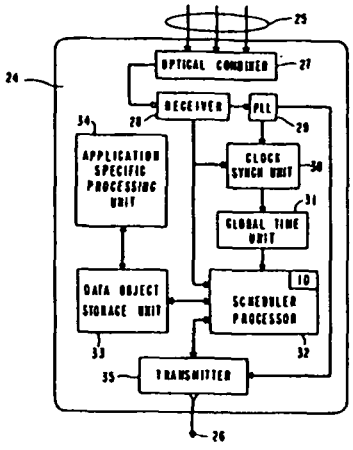
N93-19052*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

FAULT-TOLERANT FIBER OPTIC BACKPLANE Patent Application

DANIEL L. PALUMBO, inventor (to NASA) 19 Oct. 1992 30 p (NASA-CASE-LAR-14785-1; NAS 1.71:LAR-14785-1; US-PATENT-APPL-SN-963170) Avail: CASI HC A03/MF A01

A fault-tolerant, fiber optic interconnect, or backplane, which serves as a via for data transfer between modules is presented. Fault tolerance algorithms are embedded in the backplane by dividing the backplane into a read bus and a write bus and placing a redundancy management unit (RMU) between the read bus and the write bus so that all data transmitted by the write bus is subjected to the fault tolerance algorithms before the data is passed for distribution to the read bus. The RMU provides both backplane control and fault tolerance.

NASA



N93-19374*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

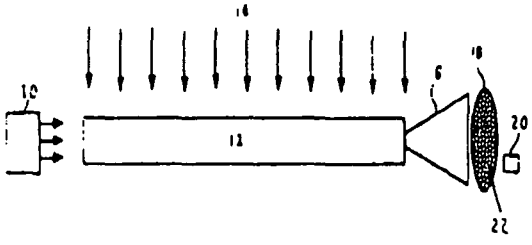
OPTICAL FIBER STRAIN SENSOR WITH IMPROVED LINEARITY Patent Application

CLAUDIO OLIVEIRA EGALON, inventor (to NASA) (Analytical Services and Materials, Inc., Hampton, VA.) and ROBERT S. ROGOWSKI, inventor (to NASA) 21 Dec. 1992 10 p

(NASA-CASE-LAR-14857-1-SB; NAS 1.71:LAR-14857-1-SB; US-PATENT-APPL-SN-994593) Avail: CASI HC A02/MF A01

A strain sensor is constructed from a two mode optical fiber. When the optical fiber is surface mounted in a straight line and the object to which the optical fiber is mounted is subjected to strain within a predetermined range, the light intensity of any point at the output of the optical fiber will have a linear relationship to strain, provided the intermodal phase difference is less than 0.17 radians.

NASA



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SOLID-STATE PHYSICS

Includes superconductivity.

N93-11056* National Aeronautics and Space Administration. Pasadena Office, CA.

INAS HOLE-IMMOBILIZED DOPING SUPERLATTICE LONG-WAVE-INFRARED DETECTOR Patent

JOSEPH MASERJIAN, inventor (to NASA) (Jet Propulsion Lab., California Inst. of Tech., Pasadena.) 21 Jul. 1992 11 p Filed 7 Feb. 1991

(NASA-CASE-NPO-17880-1-CU; US-PATENT-5,132,763; US-PATENT-APPL-SN-651882; US-PATENT-CLASS-357-30; US-PATENT-CLASS-357-4; US-PATENT-CLASS-357-16; INT-PATENT-CLASS-H01L-29/205; INT-PATENT-CLASS-H01L-31/10) Avail: US Patent and Trademark Office

An approach to long-wave-infrared (LWIR) technology is discussed. The approach is based on molecular beam epitaxy (MBE) growth of hole immobilized doping superlattices in narrow band gap 3-5 semiconductors, specifically, InAs and InSb. Such superlattices are incorporated into detector structures suitable for focal plane arrays. An LWIR detector that has high detectivity performance to wavelengths of about 16 microns at operating temperatures of 65K, where long-duration space refrigeration is plausible, is presented.

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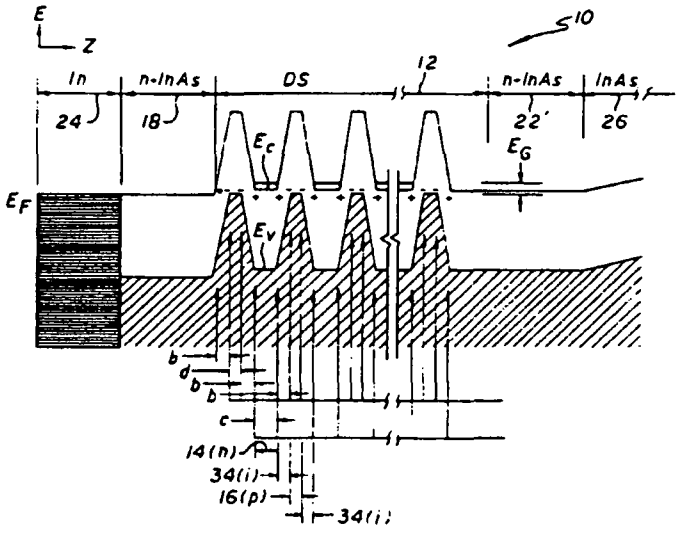

N93-14707* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

CRYSTAL GROWTH IN A MICROGRAVITY ENVIRONMENT Patent

ROGER L. KROES, inventor (to NASA), DONALD A. REISS, inventor (to NASA), and SANDOR L. LEHOCZKY, inventor (to NASA) 22 Dec. 1992 6 p Filed 19 Jun. 1991 Supersedes N91-26968 (29 - 18, p 3071)

(NASA-CASE-MFS-28473-1; US-PATENT-5,173,087; US-PATENT-APPL-SN-717447; US-PATENT-CLASS-23-295R; US-PATENT-CLASS-23-300; US-PATENT-CLASS-156-DIG.62; INT-PATENT-CLASS-B01D-9/02) Avail: US Patent and Trademark Office

Gravitational phenomena, including convection, sedimentation, and interactions of materials with their containers all affect the crystal growth process. If they are not taken into consideration they can have adverse effects on the quantity and quality of crystals produced. As a practical matter, convection, and sedimentation can be completely eliminated only under conditions of low gravity attained during orbital flight. There is, then, an advantage to effecting crystallization in space. In the absence of convection in a microgravity environment cooling proceeds by thermal diffusion from the walls to the center of the solution chamber. This renders control of nucleation difficult. Accordingly, there is a need for a new improved nucleation process in space. Crystals are nucleated by creating a small localized region of high relative supersaturation in a host solution at a lower degree of supersaturation.

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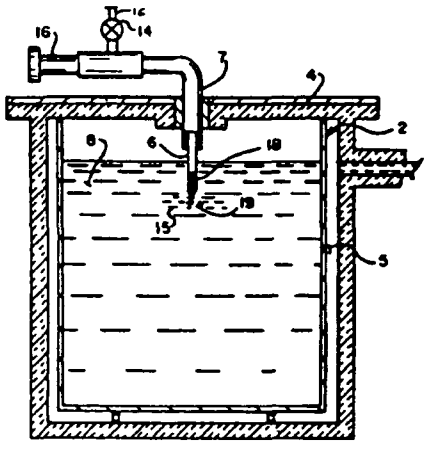


N93-15151*# National Aeronautics and Space Administration. Pasadena Office, CA.

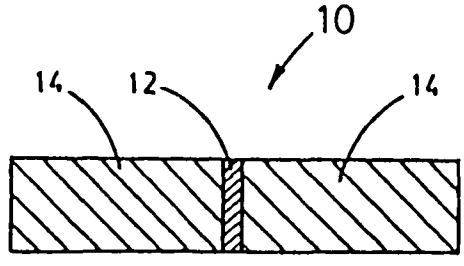
EPITAXIAL HETEROJUNCTIONS OF OXIDE SEMICONDUCTORS AND METALS ON HIGH TEMPERATURE SUPERCONDUCTORS Patent Application

RICHARD P. VASQUEZ, inventor (to NASA), BRIAN D. HUNT, inventor (to NASA), and MARC C. FOOTE, inventor (to NASA) 11 Mar. 1992 19 p (Contract NAS7-918)

(NASA-CASE-NPO-18483-1-CU; NAS 1.71:NPO-18483-1-CU; US-PATENT-APPL-SN-852620) Avail: CASI HC A03/MF A01

Epitaxial heterojunctions formed between high temperature superconductors and metallic or semiconducting oxide barrier layers are provided. Metallic perovskites such as LaTiO3, CaVO3, and SrVO3 are grown on electron-type high temperature superconductors such as Nd(1.85)Ce(0.15)CuO(4-x). Alternatively, transition metal bronzes of the form A(x)MO(3) are epitaxially grown on electron-type high temperature superconductors. Also, semiconducting oxides of perovskite-related crystal structures such as WO3 are grown on either hole-type or electron-type high temperature superconductors.

NASA



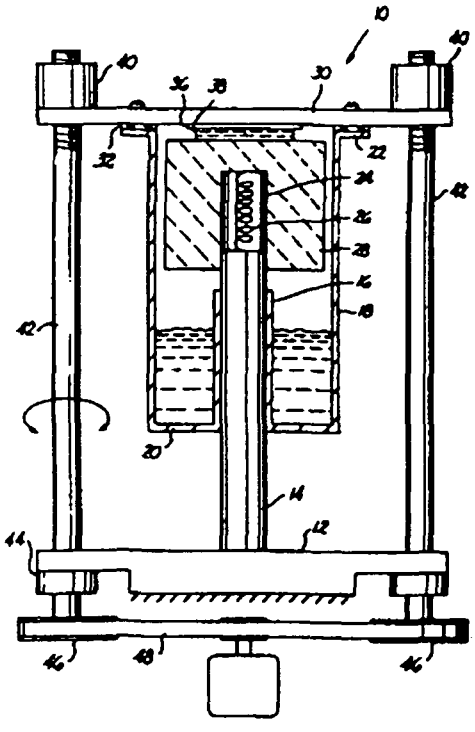
N93-17043*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

METHOD AND APPARATUS FOR CONTROLLING PROTEIN CRYSTALLIZATION Patent Application

DAVID A. NOEVER, inventor (to NASA) 28 Aug. 1992 10 p (NASA-CASE-MFS-28688-1; NAS 1.71:MFS-28688-1; US-PATENT-APPL-SN-936376) Avail: CASI HC A02/MF A01

A method and apparatus for controlling the crystallization of protein by solvent evaporation including placing a drop of protein solution between and in contact with a pair of parallel plates and driving one of the plates toward and away from the other plate in a controlled manner to adjust the spacing between the plates is presented. The drop of solution forms a liquid cylinder having a height dependent upon the plate spacing thereby effecting the surface area available for solvent evaporation. When the spacing is close, evaporation is slow. Evaporation is increased by increasing the spacing between the plates until the breaking point of the liquid cylinder. One plate is mounted upon a fixed post while the other plate is carried by a receptacle movable relative to the post and driven by a belt driven screw drive. The temperature and humidity of the drop of protein solution are controlled by sealing the drop within the receptacle and mounting a heater and dessicant within the receptacle.

NASA



N93-17413*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

PROCESS FOR THE CONTROLLED GROWTH OF SINGLE-CRYSTAL FILMS OF SILICON CARBIDE POLYTYPES ON SILICON CARBIDE WAFERS Patent Application

DAVID J. LARKIN, inventor (to NASA) and J. ANTHONY POWELL, inventor (to NASA) 9 Nov. 1992 23 p (NASA-CASE-LEW-15222-3; NAS 1.71:LEW-15222-3; US-PATENT-APPL-SN-973505) Avail: CASI HC A03/MF A01

A method for the controlled growth of single-crystal semiconductor-device-quality films of SiC polytypes on vicinal (0001) SiC wafers with low tilt angles is presented. Both homoepitaxial and heteroepitaxial SiC films can be produced on the same wafer. In particular, 3C-SiC and 6H-SiC films can be produced within selected areas of the same 6H-SiC wafer.

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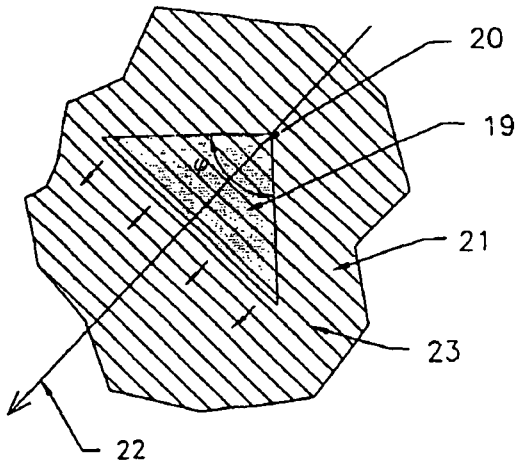

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NASA inventions, abstracted in *NASA PAB,* are available for nonexclusive or exclusive licensing in accordance with the NASA Patent Licensing Regulations. It is significant that all licenses for NASA inventions shall be by express written instruments and that no license will be granted or implied in a NASA invention except as provided in the NASA Patent Licensing Regulations.

Inquiries concerning the NASA Patent Licensing Program or the availability of licenses for the commercial use of NASA-owned inventions covered by U.S. patents or pending applications for patent should be forwarded to the NASA Patent Counsel of the NASA installation having cognizance of the specific invention, or the Associate General Counsel for Intellectual Property, code GP, National Aeronautics and Space Administration, Washington, D.C. 20546. Inquiries should refer to the NASA Case Number, the Title of the Invention, and the U.S. Patent Number or the U.S. Application Serial Number assigned to the invention as shown in *NASA PAB.*

The NASA Patent Counsel having cognizance of the invention is determined by the first three letters or prefix of the NASA Case Number assigned to the invention. The addresses of NASA Patent Counsels are listed alongside the NASA Case Number prefix letters in the following table.

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NASA Case Number Prefix Letters	Address of Cognizant NASA Patent Counsel
ARC-xxxxx XAR-xxxxx	Ames Research Center Mail Code: 200-11A Moffett Field, California 94035 Telephone: (415) 694-5104
ERC-xxxxx XER-xxxxx HQN-xxxxx XHQ-xxxxx	NASA Headquarters Mail Code: GP Washington, DC 20546 Telephone: (202) 358-2066
GSC-xxxxx XGS-xxxxx	Goddard Space Flight Center Mail Code: 204 Greenbelt, Maryland 20771 Telephone: (301) 286-7351
KSC-xxxxx XKS-xxxxx	John F. Kennedy Space Center Mail Code: PT-PAT Kennedy Space Center, Florida 32899 Telephone: (305) 867-2544
LAR-xxxxx XLA-xxxxx	Langley Research Center Mail Code: 279 Hampton, Virginia 23365 Telephone: (804) 865-3725
LEW-xxxxx XLE-xxxxx	Lewis Research Center Mail Code: 500-318 21000 Brookpark Road Cleveland, Ohio 44135 Telephone: (216) 433-5753
MSC-xxxxx XMS-xxxxx	Lyndon B. Johnson Space Center Mail Code: AL3 Houston, Texas 77058 Telephone: (713) 483-4871
MFS-xxxxx XMF-xxxxx	George C. Marshall Space Flight Center Mail Code: CC01 Huntsville, Alabama 35812 Telephone: (205) 544-0024
NPO-xxxxx XNP-xxxxx FRC-xxxxx XFR-xxxxx WOO-xxxxx	NASA Resident Legal Office Mail Code: 180-801 4800 Oak Grove Drive Pasadena, California 91103 Telephone: (818) 354-2700

PATENT LICENSING REGULATIONS

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

14 CFR Part 1245

Licensing of NASA Inventions

AGENCY: National Aeronautics and Space Administration
ACTION: Interim regulation with comments requested.

SUMMARY: The National Aeronautics and Space Administration (NASA) is revising its patent licensing regulations to conform with Pub. L. 96-517. This interim regulation provides policies and procedures applicable to the licensing of federally owned inventions in the custody of the National Aeronautics and Space Administration, and implements Pub. L. 96-517. The object of this subpart is to use the patent system to promote the utilization of inventions arising from NASA supported research and development.

EFFECTIVE DATE: July 1, 1981. Comments must be received in writing by December 2, 1981. Unless a notice is published in the **Federal Register** after the comment period indicating changes to be made, this interim regulation shall become a final regulation.

ADDRESS: Mr. John G. Mannix, Director of Patent Licensing, GP-4, NASA, Washington, D.C. 20546

FOR FURTHER INFORMATION CONTACT:
Mr. John G. Mannix, (202) 755-3954.

SUPPLEMENTARY INFORMATION:

PART 1245—PATENTS AND OTHER INTELLECTUAL PROPERTY RIGHTS

Subpart 2 of Part 1245 is revised to read as follows:

* * * * *

Subpart 2—Licensing of NASA Inventions

Sec.

Restrictions and Conditions

Types of Licenses

Procedures

Authority: 35 U.S.C. Section 207 and 208.94 Stat 3023 and 3024.

* * * * *

Subpart 2—Licensing of NASA Inventions

§ 1245.200 Scope of subpart.

This subpart prescribes the terms, conditions and procedures upon which a NASA invention may be licensed. It does not affect licenses which (a) were in effect prior to July 1, 1981; (b) may exist at the time of the Government's acquisition of title to the invention, including those resulting from the allocation of rights to inventions made under Government research and development contracts; (c) are the result of an authorized exchange of rights in the settlement of patent disputes; or (d) are otherwise authorized by law or treaty.

§ 1245.201 Policy and objective.

It is the policy and objective of this subpart to use the patent system to promote the utilization of inventions arising from NASA supported research and development.

§ 1245.202 Definitions

(a) "Federally owned invention" means an invention, plant, or design which is covered by a patent, or patent application in the United States, or a patent, patent application, plant variety protection, or other form of protection, in a foreign country, title to which has been assigned to or otherwise vested in the United States Government.

(b) "Federal agency" means an executive department, military department, Government corporation, or independent establishment, except the Tennessee Valley Authority, which has custody of a Federally owned invention.

(c) "NASA Invention" means a Federally owned invention with respect to which NASA maintains custody and administration, in whole or in part, of the right, title or interest in such invention on behalf of the United States Government.

(d) "Small business firm" means a small business concern as defined at section 2 of Pub. L. 85-536 (15 U.S.C. 632) and implementing regulations of the Administrator of the Small Business Administration. For the purpose of these regulations, the size standard for small business concerns involved in Government procurement, contained in 13 CFR 121.3-8, and in subcontracting, contained in 13 CFR 121.3-12, will be used.

(e) "Practical application" means to manufacture in the case of a composition or product, to practice in the case of a process or method, or to operate in the case of a machine or system; and, in each case, under such condition, as to establish that the invention is being utilized and that its benefits are to the extent permitted by law or Government regulations available to the public on reasonable terms.

(f) "United States" means the United States of America, its territories and possessions, the District of Columbia, and the Commonwealth of Puerto Rico.

§ 1245.203 Authority to grant licenses.

NASA inventions shall be made available for licensing as deemed appropriate in the public interest. NASA may grant nonexclusive, partially exclusive, or exclusive licenses thereto under this subpart on inventions in its custody.

Restrictions and Conditions

§ 1245.204 All licenses granted under this subpart.

(a) *Restrictions.* (1) A license may be granted only if the applicant has supplied NASA with a satisfactory plan for development or marketing of the invention, or both, and with information about the applicant's capability to fulfill the plan.

(2) A license granting rights to use or sell under a NASA invention in the United States shall normally be granted only to a licensee who agrees that any products embodying the invention or produced through the use of the invention will be manufactured substantially in the United States.

(b) *Conditions.* Licenses shall contain such terms and conditions as NASA determines are appropriate for the protection of the interests of the Federal Government and the public and are not in conflict with law or this subpart. The following terms and conditions apply to any license:

(1) The duration of the license shall be for a period specified in the license agreement, unless sooner terminated in accordance with this subpart.

(2) The license may be granted for all or less than all fields of use of the invention or in specified geographical areas, or both.

(3) The license may extend to subsidiaries of the licensee or other parties if provided for in the license but shall be nonassignable without approval of NASA, except to the successor of that part of the licensee's business to which the invention pertains.

(4) The license may provide the licensee the right to grant sublicenses under the license, subject to the approval of NASA. Each sublicense shall make reference to the license, including the rights retained by the Government, and a copy of such sublicense shall be furnished to NASA.

(5) The license shall require the licensee to carry out the plan for development or marketing of the invention, or both, to bring the invention to practical application within a period specified in the license, and to continue to make the benefits of the invention reasonably accessible to the public.

(6) The license shall require the licensee to report periodically on the utilization or efforts at obtaining utilization that are being made by the licensee, with particular reference to the plan submitted.

(7) All licenses shall normally require royalties or other consideration.

(8) Where an agreement is obtained pursuant to § 1245.204(a)(2) that any products embodying the invention or produced through use of the invention will be manufactured substantially in the United States, the license shall recite such agreement.

(9) The license shall provide for the right of NASA to terminate the license, in whole or in part, if:

(i) NASA determines that the licensee is not executing the plan submitted with its request for a license and the licensee cannot otherwise demonstrate to the satisfaction of NASA that it has taken or can be expected to take within a reasonable time effective steps to achieve practical application of the invention;

(ii) NASA determines that such action is necessary to meet requirements for public use specified by Federal regulations issued after the date of the license and such requirements are not reasonably satisfied by the licensee;

(iii) The licensee has willfully made a false statement of or willfully omitted a material fact in the license application or in any report required by the license agreement; or

(iv) The licensee commits a substantial breach of a covenant or agreement contained in the license.

(10) The license may be modified or terminated, consistent with this subpart, upon mutual agreement of NASA and the licensee.

(11) Nothing relating to the grant of a license, nor the grant itself, shall be construed to confer upon any person any immunity from or defenses under the antitrust laws or from a charge of patent misuse, and the acquisition and use of rights pursuant to this subpart shall not be immunized from the operation of state or Federal law by reason of the source of the grant.

Types of Licenses

§ 1245.205 Nonexclusive licenses.

(a) *Availability of licenses.* Nonexclusive licenses may be granted under NASA inventions without publication of availability or notice of a prospective license.

(b) *Conditions.* In addition to the provisions of § 1245.204, the nonexclusive license may also provide that, after termination of a period specified in the license agreement, NASA may restrict the license to the fields of use or geographic areas, or both, in which the licensee has brought the invention to practical application and continues to make the benefits of the invention reasonably accessible to the public. However, such restriction shall be made only in order to grant an exclusive or partially exclusive license in accordance with this subpart.

§ 1245.206 Exclusive and partially exclusive licenses.

(a) Domestic licenses.

(1) *Availability of licenses.* Exclusive or partially exclusive licenses may be granted on NASA inventions: (i) 3 months after notice of the invention's availability has been announced in the **Federal Register;** or (ii) without such notice where NASA determines that expeditious granting of such a license will best serve the interests of the Federal Government and the public; and (iii) in either situation, specified in (a)(1)(i) or (ii) of this section only if:

(A) Notice of a prospective license, identifying the invention and the prospective licensee, has been published in the **Federal Register,** providing opportunity for filing written objections within a 60-day period;

(B) After expiration of the period in § 1245.206(a)(1)(iii)(A) and consideration of nay written objections received during the period, NASA has determined that:

(*1*) The interests of the Federal Government and the public will best be served by the proposed license, in view of the applicant's intentions, plans, and ability to bring the invention to practical application or otherwise promote the invention's utilizaiton by the public;

(*2*) The desired practical application has not been achieved, or is not likely expeditiously to be achieved, under any nonexclusive license which has been granted, or which may be granted, on the invention;

(*3*) Exclusive or partially exclusive licensing is a reasonable and necessary incentive to call forth the investment of risk capital and expenditures to bring the invention to practical application or otherwise promote the invention's utilization by the public; and

(*4*) The proposed terms and scope of exclusivity are not greater than reasonably necessary to provide the incentive for bringing the invention to practical application or otherwise promote the invention's utilization by the public;

(C) NASA has not determined that the grant of such license will tend substantially to lessen competition or result in undue concentration in any section of the country in any line of commerce to which the technology to be licensed relates, or to create or maintain other situations inconsistent with the antitrust laws; and

(D) NASA has given first preference to any small business firms submitting plans that are determined by the agency to be within the capabilities of the firms and as equally likely, if executed, to bring the invention to practical application as any plans submitted by applicants that are not small business firms.

(2) *Conditions.* In addition to the provisions of § 1245.204, the following terms and conditions apply to domestic exclusive and partially exclusive licenses:

(i) The license shall be subject to the irrevocable, royalty-free right of the Government of the United States to practice and have practiced the invention on behalf of the United States and on behalf of any foreign government or international organization pursuant to any existing or future treaty or agreement with the United States.

(ii) The license shall reserve to NASA the right to require the licensee to grant sublicenses to responsible applicants, on reasonable terms, when necessary to fulfill health or safety needs.

(iii) The license shall be subject to any licenses in force at the time of the grant of the exclusive or partially exclusive license.

(iv) The license may grant the licensee the right of enforcement of the licensed patent pursuant to the provisions of Chapter 29 of Title 35, United States Code, or other statutes, as determined appropriate in the public interest.

(b) Foreign licenses.

(1) *Availability of licenses.* Exclusive or partially exclusive licenses may be granted on a NASA invention covered by a foreign patent, patent application, or other form of protection, provided that:

(*i*) *Notice of a prospective license, identifying the invention and prospective* licensee, has been published in the **Federal Register,** providing opportunity for filing written objections within a 60-day period and following consideration of such objections;

(ii) NASA has considered whether the interests of the Federal Government or United States industry in foreign commerce will be enhanced; and

(iii) NASA has not determined that the grant of such license will tend substantially to lessen competition or result in undue concentration in any section of the United States in any line of commerce to which the technology to be licensed relates, or to create or maintain other situations inconsistent with antitrust laws.

(2) *Conditions.* In addition to the provisions of § 1245.204, the following terms and conditions apply to foreign exclusive and partially exclusive licenses:

(i) The license shall be subject to the irrevocable, royalty-free right of the Government of the United States to practice and have practiced the invention on behalf of the United States and on behalf of any foreign government or international organization pursuant to any existing or future treaty or agreement with the United States.

(ii) The license shall be subject to any licenses in force at the time of the grant of the exclusive or partially exclusive license.

(iii) The license may grant the licensee the right to take any suitable and necessary actions to protect the licensed property, on behalf of the Federal Government.

(c) *Record of determinations.* NASA shall maintain a record of determinations to grant exclusive or partially exclusive licenses.

Procedures

§ 1245.207 Application for a license.

An application for a license should be addressed to the Patent Counsel at the NASA installation having responsibility for the invention and shall normally include:

(a) Identification of the invention for which the license is desired, including the patent application serial number or patent number, title, and date, if known;

(b) Identification of the type of license for which the application is submitted;

(c) Name and address of the person, company, or organization applying for the license and the citizenship or place of incorporation of the applicant;

(d) Name, address, and telephone number of representative of applicant to whom correspondence should be sent;

(e) Nature and type of applicant's business, identifying products or services which the applicant has successfully commercialized, and approximate number of applicant's employees;

(f) Source of information concerning the availability of a license on the invention;

(g) A statement indicating whether applicant is a small business firm as defined in § 1245.202(c);

(h) A detailed description of applicant's plan for development or marketing of the invention, or both, which should include:

(1) A statement of the time, nature and amount of anticipated investment of capital and other resources which applicant believes will be required to bring the invention to practical application;

(2) A statement as to applicant's capability and intention to fulfill the plan, including information regarding manufacturing, marketing, financial, and technical resources;

(3) A statement of the fields of use for which applicant intends to practice the invention; and

(4) A statement of the geographic areas in which applicant intends to manufacture any products embodying the invention and geographic areas where applicant intends to use or sell the invention, or both;

(i) Identification of licenses previously granted to applicant under Federally owned inventions;

(j) A statement containing applicant's best knowledge of the extent to which the invention is being practiced by private industry or Government, or both, or is otherwise available commercially; and

(k) Any other information which applicant believes will support a determination to grant the license to applicant.

§ 1245.208 Processing applications.

(a) Applications for licenses will be initially reviewed by the Patent Counsel of the NASA installation having responsibility for the invention. The Patent Counsel shall make a preliminary recommendation to the Director of Licensing, NASA Headquarters, whether to: (1) grant the license as requested, (2) grant the license with modification after negotiation with the licensee, or (3) deny the license. The Director of Licensing shall review the preliminary recommendation of the Patent Counsel and make a final recommendation to the NASA Assistant General Counsel for Patent Matters. Such review and final recommendation may include, and be based on, any additional information obtained from applicant and other sources that the Patent Counsel and the Director of Licensing deem relevant to the license requested. The determination to grant or deny the license shall be made by the Assistant General Counsel for Patent Matters based on the final recommendation of the Director of Licensing.

(b) When notice of a prospective exclusive or partially exclusive license is published in the **Federal Register** in accordance with § 1245.206(a)(1)(iii)(A) or § 1245.206(b)(1)(i), any written objections received in response thereto will be considered by the Director of Licensing in making the final recommendation to the Assistant General Counsel for Patent Matters.

(c) If the requested license, including any negotiated modifications, is denied by the Assistant General Counsel for Patent Matters, the applicant may request reconsideration by filing a written request for reconsideration within 30 days after receiving notice of denial. This 30-day period may be extended for good cause.

(d) In addition to, or in lieu of requesting reconsideration, the applicant may also appeal the denial of the license in accordance with § 1245.211.

§ 1245.209 Notice to Attorney General.

A copy of the notice provided for in §§ 1245.206(a)(1)(iii)(A), and 1245.206(b)(1)(i) will be sent to the Attorney General.

§ 1245.210 Modification and termination of licenses.

Before modifying or terminating a license, other than by mutual agreement, NASA shall furnish the licensee and any sublicensee of record a written notice of intention to modify or terminate the license, and the licensee and any sublicensee shall be allowed 30 days after such notice to remedy any breach of the license or show cause why the license should not be modified or terminated.

§ 1245.211 Appeals.

(a) The following parties may appeal to the NASA Administrator or designee any decision or determination concerning the grant, denial, interpretation, modification, or termination of a license:

(1) A person whose application for a license has been denied;

(2) A licensee whose license has been modified or terminated, in whole or in part; or

(3) A person who timely filed a written objection in response to the notice required by §§ 1245.206(a)(1)(iii)(A) or 1245.206(b)(1)(i) and who can demonstrate to the satisfaction of NASA that such person may be damaged by the Agency action.

(b) Written notice of appeal must be filed within 30 days (or such other time as may be authorized for good cause shown) after receiving notice of the adverse decision or determination; including, an adverse decision following the request for reconsideration under § 1245.208(c). The notice of appeal, along with all supporting documentation should be addressed to the Administrator, National Aeronautics and Space Administration, Washington, DC 20546. Should the appeal raise a genuine dispute over material facts, fact-finding will be conducted by the NASA Inventions and Contributions Board. The person filing the appeal shall be afforded an opportunity to be heard and to offer evidence in support of the appeal. The Chairperson of the Inventions and Contributions Board shall prepare written findings of fact and transmit them to the Administrator or designee. The decision on the appeal shall be made by the NASA Administrator or designee. There is no further right of administrative appeal from the decision of the Administrator or designee.

§ 1245.212 Protection and administration of inventions.

NASA may take any suitable and necessary steps to protect and administer rights to NASA inventions, either directly or through contract.

§ 1245.213 Transfer of custody.

NASA having custody of certain Federally owned inventions may transfer custody and administration in whole or in part, to another Federal agency, of the right, title, or interest in any such invention.

§ 1245.214 Confidentiality of information.

Title 35, United States Code, section 209, provides that any plan submitted pursuant to § 1245.207(h) and any report required by § 1245.204(b)(6) may be treated by NASA as commercial and financial information obtained from a person and privileged and confidential and not subject to disclosure under section 552 of Title 5 of the United States Code.

James M. Beggs,

Administrator.

October 15, 1981.

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15. Supplementary Notes

Section 1: Abstracts

16. Abstract

Abstracts are provided for 128 patents and patent applications entered into the NASA scientific and technical information system during the period January 1993 through June 1993. Each entry consists of a citation, an abstract, and in most cases, a key illustration selected from the patent or patent application.

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